DOCUMENT RESUME

ED 443 439 IR 057 879

AUTHOR	Booker, Di, Ed.
TITLE	Concept, Challenge, Conundrum: From Library Skills to Information Literacy. Proceedings of the National Information Literacy Conference Conducted by the University of South Australia Library and the Australian Library and Information Association Information Literacy Special Interest Group (4th, Adelaide, Australia, December 3-5, 1999).
INSTITUTION	University of South Australia, Underdale.
ISBN	ISBN-0-86803-668-4
PUB DATE	1999-00-00
NOTE	231p.; Single or multiple reproduction, without permission, of up to 20% of these proceedings for noncommercial purposes is encouraged, subject to acknowledgment.
AVAILABLE FROM	Library Publications, University of South Australia, Holbrooks Road, Underdale, SA 5032 ($45 plus 10% GST, including postage within Australia). Tel: 08-8302-6260.
PUB TYPE	Collected Works - Proceedings (021)
EDRS PRICE	MF01/PC10 Plus Postage.
DESCRIPTORS	Academic Libraries; Conferences; Elementary Secondary Education; Foreign Countries; Higher Education; *Information Literacy; Information Technology; Librarians; Professional Development; School Libraries; Workshops
IDENTIFIERS	Australia

ABSTRACT

These proceedings from the fourth National Information Literacy Conference (Decemeber 1999) include the keynote addresses and the papers presented in workshop sessions throughout the conference. Acknowledgements by Irene Doskatsch, conference convener, that precedes the introductory piece by Alan Bundy, "Journey Without End..." is followed by these papers: "Information Literacy and the Foundations for Lifelong Learning" (Denis Ralph); Keynote Address: "What All Librarians Can Learn from Teacher Librarians: Information Literacy a Key Connector for Libraries" (Ken Haycock); Keynote Address: Information Literacy: Concept, Conundrum, and Challenge (Ross Todd); "Teaching Information Literacy Skills to Indigenous Adults" (Joanne Anderson); "The Role of the Library in an Integrated Computer and Information Literacy Program at Swinburne University of Technology" (Julie Badger); "Why Won't They Use Our Library? Implications of a Pilot Study Investigating the Information Seeking Preferences of Secondary School Teachers" (Julia Bale); "Second Thoughts about Information Literacy" (Susan Boyce); "Integrating Information Literacy into the Health Sciences Curriculum: Longitudinal Study of an Information Literacy Program at the University of Wollongong" (Chris Brewer); "Information and Information Technology Use in Undergraduate Legal Education" (Natalie Cuffe and Christine Bruce); "Information Literacy Lessons from EdNA Online" (Jillian Dellit); "Putting It Online: Information Research Skills for Postgraduates" (Anne Douglas and Lynn Murdoch); "Changing the Mindset: Creating Information Literate Engineers" (Anne Draper and Leith Woodall); "Internet Sources for Lifelong Learning: A Model for Incorporating a Web Component into a Course" (Carole Duffill); "The Dream Student...A Case Study of an Information Literacy Model for Higher Education" (Robin Graham and Justine Lester); "Too

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Easy--"Web-ezy": an Interactive Library Skills Package" (Garry Hall); "Subject Specialist or Information Expert?" (Liz Hartmann and Kerry Matheson); "Improving Information Skills Programs Using Action Research" (Claire Hill); "An Australian Information Literacy Institute Proposal" (Diana Kingston); "Cooperation and Information Skills Resources" (Diana Kingston); "Striking the Right Balance: Information Literacy and Partnerships between Librarian, Lecturer, and Student" (Maureen Nimon); "Getting Information Literacy into the Curriculum: The Ongoing Dilemma, and How To Be Involved When You Are on the Edge" (Graeme Oke and Jenny Cameron); "Information Literacy and Health Science: Developing a Comprehensive and Sustainable Model" (Debbie Orr, Margie Wallin, Leone Hinton); "Profiling an Information Literature Law Firm" (Carmel O'Sullivan); "From Trainers to Educators: Librarians and the Challenge of Change" (Judith Peacock); "Integration of Information Skills into the School Curriculum at Trinity Lutheran College" (Sharon Rushton); "Information Literacy Competency Standards Workshop" (Patricia Iannuzzi); and Panel Session: "What Is the Challenge?" (Ross Todd, Ken Haycock, Carmel O'Sullivan, Linda Langford, Alan Bundy). Contributor profiles, contact information for conference delegates, and the conference program are also included. (AEF)

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ED 443 439

CONCEPT, CHALLENGE, CONUNDRUM: FROM LIBRARY SKILLS TO INFORMATION LITERACY

Proceedings of the fourth national information literacy conference conducted by the University of South Australia Library and the Australian Library and Information Association Information Literacy Special Interest Group
3 – 5 December 1999

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'Information literacy is critical to student success. The guideposts for successful implementation of effective information literacy programs in tertiary institutions are clear. Their attainment, however, will require considerable time, leadership and resources reflecting a partnership of librarians, faculty and administrators'
Professor Ken Haycock, University of British Columbia

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Proceedings of the fourth national information
literacy conference conducted by the
University of South Australia Library
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Information Literacy Special Interest Group
3 – 5 December 1999

Convener ***Irene Doskatsch***

Editor
Di Booker

Adelaide
University of South Australia Library
2000

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A limited number of copies are still available of the proceedings of the previous information literacy conferences –
Information literacy: the Australian agenda (1992) $30 plus 10% GST, including postage
Learning for life: information literacy and the autonomous learner (1995) $30 plus 10% GST, including postage
Information literacy: the professional issue (1997) $40 plus 10% GST, including postage

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National Library of Australia Cataloguing-in-Publication data

Concept, challenge, conundrum: from library skills to information literacy, proceedings of the fourth national information literacy conference conducted by the University of South Australia Library and the Australian Library and Information Association Information Literacy Special Interest Group, 3, 4 and 5 December 1999.

ISBN 0 86803 668 4

1. Information services - Australia - User education - Congresses. 2. Information services - User education - Congresses. 3. Libraries and education - Australia - Congresses. 4. Adult learning - Australia - Congresses. I. Booker, Diane, 1943-. II. University of South Australia. Library.

028.70994

CONTENTS

Preface 1
Di Booker

Journey without end... 4
Alan Bundy

Information literacy and the foundations for lifelong learning 6
Denis Ralph

Keynote address: What all librarians can learn from teacher librarians: information literacy a key connector for libraries 15
Ken Haycock

Keynote address 25
Ross Todd

Teaching information literacy skills to indigenous adults 35
Joanne Anderson

The role of the library in an integrated computer and information literacy program at Swinburne University of Technology 40
Julie Badger

Why won't they use our library? Implications of a pilot study investigating the information seeking preferences of secondary school teachers 48
Julia Bale

Second thoughts about information literacy 57
Susan Boyce

Integrating information literacy into the health sciences curriculum: longitudinal study of an information literacy program at the University of Wollongong 66
Chris Brewer

Information and information technology use in undergraduate legal education 76
Natalie Cuffe and *Christine Bruce*

Information literacy lessons from *EdNA Online* 89
Jillian Dellit

Putting it online: information research skills for postgraduates 99
Anne Douglas and *Lynn Murdoch*

Changing the mindset: creating information literate engineers 106
Anne Draper and *Leith Woodall*

Internet sources for lifelong learning: a model for incorporating a web component into a course 116
Carole Duffill

The dream student ... a case study of an information literacy model for higher education 122
Robin Graham and *Justine Lester*

Too easy – *Web-ezy*: an interactive library skills package 128
Garry Hall

Subject specialist or information expert? 134
Liz Hartmann and *Kerry Matheson*

Improving information skills programs using action research 139
Claire Hill

An Australian Information Literacy Institute proposal 147
Diana Kingston

Cooperation and information skills resources 152
Diana Kingston

Striking the right balance: information literacy and partnerships between librarian, lecturer, and student 157
Maureen Nimon

Getting information literacy into the curriculum: the ongoing dilemma, and how to be involved when you are on the edge 165
Graeme Oke and *Jenny Cameron*

Information literacy and health science: developing a comprehensive and sustainable model 169
Debbie Orr, Margie Wallin and *Leone Hinton*

Profiling an information literate law firm 176
Carmel O'Sullivan

From trainers to educators: librarians and the challenge of change 182
Judith Peacock

Integration of information skills into the school curriculum at Trinity Lutheran College 193
Sharon Rushton

Information Literacy competency standards workshop 197
Patricia Iannuzzi

Panel session: what is the challenge? 203
Panel: Ross Todd, Ken Haycock, Carmel O'Sullivan, Linda Langford
Chair: Alan Bundy

About the contributors 206

Conference delegates 213

Conference program 219

Acknowledgements

The three key ingredients of a successful conference are stimulating and thought provoking speakers, enthusiastic delegates and a dedicated and creative program planning committee. The fourth national conference on information literacy had all three.

I am especially thankful to

- Denis Ralph for taking time from his busy schedule to open the conference
- Ken Haycock and Patricia Iannuzzi who crossed the Pacific to share their wisdom and ignite discussion
- Ross Todd for challenging us to think 'outside the square'
- The workshop presenters whose thought provoking papers and presentations were the focus of lievly debate
- The program planning committee for its support and commitment to the conference
- University of SA library staff who volunteered their time to help with conference infrastructure

Irene Doskatsch
Conference Convener

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PREFACE

One hundred and fifty six delegates from Australia and New Zealand met in Adelaide for the fourth national information literacy conference in December 1999. Organised again by the University of South Australia Library with the ALIA Information Literacy Special Interest Group, the conference provided participants with the opportunity to consider the concepts, challenges and conundrums presented by information literacy as currently promulgated in the library and information profession. These proceedings include the keynote addresses and the papers presented in workshop sessions throughout the conference.

Making the connections between lifelong learning and information literacy so that 'learning to learn' becomes an integral part of the educational paradigm is the challenge presented by Professor Denis Ralph, Director of the South Australian Centre for Lifelong Learning and Development in his opening address.

Picking up on the title of the conference, Ross Todd encouraged delegates to 'reflect on the *concept*: charting the landscape and celebrating achievements; posit the *conundrum*: critiquing the present and identifying some current dilemmas: and focus on the *challenges*: constructing a future from rhetoric to reality and to take information literacy out of the educational arena into the wider social environment. Ross suggests in his paper that the real purpose of information literacy is not to assist students to pass exams and write brilliant assignments but rather to bring people and information together in a purposeful way so that they can achieve success in their everyday lives. Extending the concept of information literacy out of the education sector and defining it in terms of the dimensions of everyday life provided a major challenge for the delegates and this theme was reiterated in several presentations and during question times throughout the conference.

In questioning what the information literacy outcomes for the library and information sector are, he indicates that the key challenge for us is to consider how the possession of information literacy skills empowers people in their everyday lives. Presently we are concerned with 'people relating to information' – we should be considering 'people relating to life'. If information literacy is the solution, 'what is the problem?'

Ross also suggests some challenges for those involved in research. The theoretical foundations of information literacy should include

- increased understanding of the importance of information literacy
- articulation of 'stronger theoretical roots of information literacy' including
  - 'a stronger focus on a theory of information rather than a theory of literacy
  - a focus on understanding the voice/perspective of the everyday information user and nonuser
  - focus on people making sense and constructing meaning through information'
- information on the complexities of how people engage with information and the barriers they face
- how information literacy is placed in 'the broader social environment beyond formal education.'

Ross concludes that building a strong theoretical foundation for information literacy will enable us…

> to more holistically understand the complexities of how people engage with and use information, to understand the needs of people that prompt their search for and use of information, to understand attitudes, behaviours and needs related to people's interactions with information. There already exists an extensive body of research findings that can illuminate this, based on studies of information user behaviour, cognitive information processing, knowledge construction and representation, and information utilisation. The analysis and interpretation of this research will enable us to think more laterally and creatively about information literacy interventions, and enable us as practitioners to consider information literacy in a wider range of contexts, other than the educational arena.

Becoming more focused, flexible, faster and friendlier, thinking strategically and being entrepreneurial and taking risks were the concluding challenges that Ken Haycock left with the audience. In reviewing current and past research into information literacy, Ken's keynote address provides a fascinating overview of past and present practices in schools and academic institutions and a very insightful view into the future. He stresses that we do not take enough notice of the results of research: 'if it doesn't fit with out beliefs, we discard it'.

His analysis of the research in the field indicates that the criteria for successful information literacy outcomes for academic institutions will include

- positioning information literacy in the mission of the library but including access to ideas as well as information
- developing an organisational culture which supports information literacy and actually makes it happen
- developing partnerships within the organisation
- being clear about our role
- clarifying terminology – speaking in the same language as our users
- developing guidelines and policies which support information literacy
- being flexible in instructional content and practices
- facilitating cooperative program planning and teaching in all education sectors
- developing an information continuum process model
- including information in assessment and evaluation processes.

Ken's conclusion is a timely warning for those of us in academic libraries:

> Information literacy is critical to student success. The guideposts for successful implementation of effective information literacy programs in tertiary institutions are clear. Their attainment, however, will require considerable time, leadership and resources reflecting a partnership of librarians, faculty and administrators.

The papers, which were threaded around the keynote speeches, are, to date, the best indication of the seriousness with which the concept of information literacy is held in Australia. The collective reference lists will be an invaluable resource for students, academics and practitioners alike. Many papers document case studies of information literacy practices in a range of academic and professional environments – schools, specialist academic areas (law, engineering, health) while others outline issues relating to library practices including papers reporting on the results of surveys of students' information literacy outcomes. Issues related to information literacy for students in an online environment are the focus of papers from RMIT and University of Queensland including a description of the development and functionalities of the Web–ezy software package. In contrast, Joanne Anderson from Batchelor Institute of Further Education provided a fascinating (and entertaining) outline of the methods she uses to assist the development of information skills for indigenous learners.

Library staff and teachers are the focus of several papers including coping with organisational change and addressing the professional development needs of library staff.

It could be said that a concept has 'come of age' when conference presenters are prepared to challenge the concept and the well thought through paper by Susan Boyce questions the construct of information literacy. In a refreshing and brave paper, considering the audience, she challenges the prevailing definitions and practices and questions how can the concept of information literacy, which was founded in a print environment, be transferred to a digital environment. Have we 'foster(ed) an industry that maximises status by trading on socially and culturally weighted insecurities and sensitivities'?

In reexamining the concept of information literacy, Maureen Nimon's paper is underpinned by a very perceptive view of student learning. She encourages the reader to 'be alert to the limitations of what we can do. By recognising the range and complexity of the scope of skills, abilities, attitudes and knowledge that the information literate person needs, we can define our contribution to the development of students' information literacy more effectively'.

The 'big picture' challenges raised by Gillian Dellit will continue to provoke considerable discussion. Are we as an education community committed to the use of information (and by implication information literacy skills) to further democracy? What is the relationship between literacy, information literacy and technological literacy – can we separate them – are the distinctions irrelevant? How do we resolve the tension of individual versus community needs? Gillian concludes, and there was consensus in the workshop group, that 'we need to be involved in and to shape the debates, policy and the resourcing of information literacy delivery to ensure that it is applied in a way that builds the society we want, the community we wish to be part of. … we have the capacity to influence and maybe control the design, use and some of the environment in which information literacy is deployed.'

The final day of the conference provided delegates with an opportunity to comment on the American Library Association information literacy competency standards for schools (*Information power*) and higher education. Patricia Iannuzzi who currently chairs the Association of College and Research Libraries' Task Force on Information Literacy Competency Standards facilitated the workshop. Her Powerpoint presentation is included in these proceedings.

Concept, challenge, conundrum: from library skills to information literacy has been another stage in a journey collectively documented by the series of information literacy conferences sponsored by the University of South Australia and latterly the Australian Library and Information Association. Together the proceedings illustrate the growth of the concept of information literacy in Australia from infancy in 1992 through to a sophisticated practice and willing grasp of the challenges before the library and information profession.

Di Booker
Editor

CONFERENCE AIMS

- To review the common understanding of the term Information Literacy, and the concept it describes, in the Library and Information Management profession
- To appraise the connectivity between different types of libraries in promoting Information Literacy at the end of the 20th century
- To develop strategies for advancing Information Literacy as a profound educational and societal issue for the 21st century

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JOURNEY WITHOUT END . . .

Alan Bundy
University of South Australia

The main issue in this so called age of information, knowledge and lifelong learning is still receiving scant systematic attention and investment by educational institutions, bureaucracies and governments. Even if they recognise their need for information, the citizens of this Commonwealth of Australia are too often unable to share in the wealth of information, access to which they now should have in common. There are two reasons. One relates to physical access to such things as libraries, librarians and information technology. The other – even more critical – relates to a citizen's lack of the understandings and skills to identify, locate, access, evaluate and apply the needed information.

Fostering an information literate citizenry should be a core aim of formal education, for without information literacy a 21st century democratic society able to sustain lifelong learning is implausible. Yet Librarianship is still the only profession which is really alert to the issue. That alertness derives from two of its core and constant values, values without which the contribution of Librarians to society would have not much more significance than that of a computer, processing data. Those two values are ones which distinguish Librarianship from every other profession. They are the reason why many of us are Librarians.

One value is an unequivocal commitment to intellectual freedom, a commitment which no amount of politic sophistry should ever be allowed to undermine.

The other value is a commitment to the right of all citizens to access to information resources, regardless of their financial, educational and intellectual circumstances. Librarians, of course, remain the major custodians of the documentary record of civilisation, but it is the values of intellectual freedom and equity which have been the driver of a series of national information literacy conferences led by the University of South Australia Library, of which this is the fourth, since 1992.

Those conferences, and their proceedings, have unquestionably contributed to the place information literacy now has on the Australian educational, library and governmental agenda, even if educrats, educators and politicians tend to still persist in the vacuous view that it is information technology alone which is the universal panacea to address the information divide in society. It was therefore thought that with this conference it was time to take stock of where Librarianship stands on the issue of information literacy and to see if some practical action could now be initiated – but not owned – by the profession. One such action is proposed in a paper in your conference folder. Please read the paper as we hope to discuss its suggestion of an Institute for Information Literacy at the end of the conference.

The title of this conference is *Concept, challenge, conundrum*. The *Concept* seeks a response to how the concept of information literacy is understood by the profession. Is it seen as something of which library user education or bibliographic instruction is but a contributor, like computer literacy? The tendency of some libraries to simply redesignate user education programs as information literacy programs suggests confusion.

The *Challenge* in the title in part is about how to engage all library educators and practitioners in making the essential link between intellectual freedom, equity of access and information literacy. It is not just an issue for teacher and academic librarians. It is also about the educational role of special librarians in fostering an information literate clientele, something which distinguishes a mere information manager from a special librarian. And which agency in society is used by 60 per cent of the population, is accessible to all, works with the widest age range, provides reader advisory services and is increasingly providing training in the use of information technology? Yet at present few public librarians have begun to contemplate a major educational role in fostering an information literate citizenry, even in the context that public libraries are by far the largest provider of education and lifelong learning in Australia.

The *Conundrum* is there in the title because information literacy is undeniably just that for the profession. Information literacy can be too easily sidelined by educators as a 'library' issue because it is largely Teacher

Librarians and Librarians who have taken the initiative to bring it to the fore. However information literacy is not a 'library' issue, although it is an issue for Librarianship, as it should be for of all the professions. Moving the issue forward without manifesting any desire to own it is not without its tensions.

Fortunately there are some educators who recognise information literacy for what it is – a profound, meaningful issue for education and society which now has the closest possible association with the debate about lifelong learning, a concept not without its own definitional and realisation challenges. One of those educators is Professor Denis Ralph, Director of the recently established South Australian Centre for Lifelong Learning and Development who has kindly accepted our invitation to open the conference.

INFORMATION LITERACY AND FOUNDATIONS FOR LIFELONG LEARNING

Denis Ralph
South Australian Centre for Lifelong Learning and Development

Thank you for inviting me to formally open this conference, but before doing so and addressing the theme of the conference, I acknowledge that we are meeting on Kaurna Country where the traditional owners and their forebears have been custodians for many centuries – where indigenous people have performed age old ceremonies of celebration, initiation and renewal. We acknowledge their living culture and unique role in the life of the region.

A special welcome to Professor Ken Haycock of the University of British Columbia as well as other visitors to Australia attending this conference including the contingent from New Zealand.

The organisers of this conference are to be commended for setting a program which will

- review the common understanding of the term information literacy and the concept it describes in the library and information management profession
- appraise the connectivity between different types of libraries in promoting information literacy at the end of the 20th century
- develop strategies for advancing information literacy as a profound educational and societal issue for the 21st century.

Like lifelong learning, information literacy is one of those things you can spend a lifetime defining. In the lifelong learning movement there are people who have made their whole living out of running conferences on trying to define what lifelong learning is. This was evident in European conferences throughout 1998 and 1999.

Instead of joining this prolonged pursuit of the holistic perfect definition, whether it is for lifelong learning or information literacy, I support the approach taken by Christine Bruce in her book, *The seven faces of information literacy*. Bruce states that 'Information literacy scholars prefer to describe information literacy rather than to define it' and sets out a comprehensive range of descriptions of information literacy as

- using information technology
- including library and computer literacy
- acquiring mental models of information systems
- a combination of information and technology skills
- a process
- an amalgam of skills, attitudes and knowledge
- actively engaging with information
- the ability to learn
- the first component in the continuum of critical thinking skills
- part of the literacy continuum.[1]

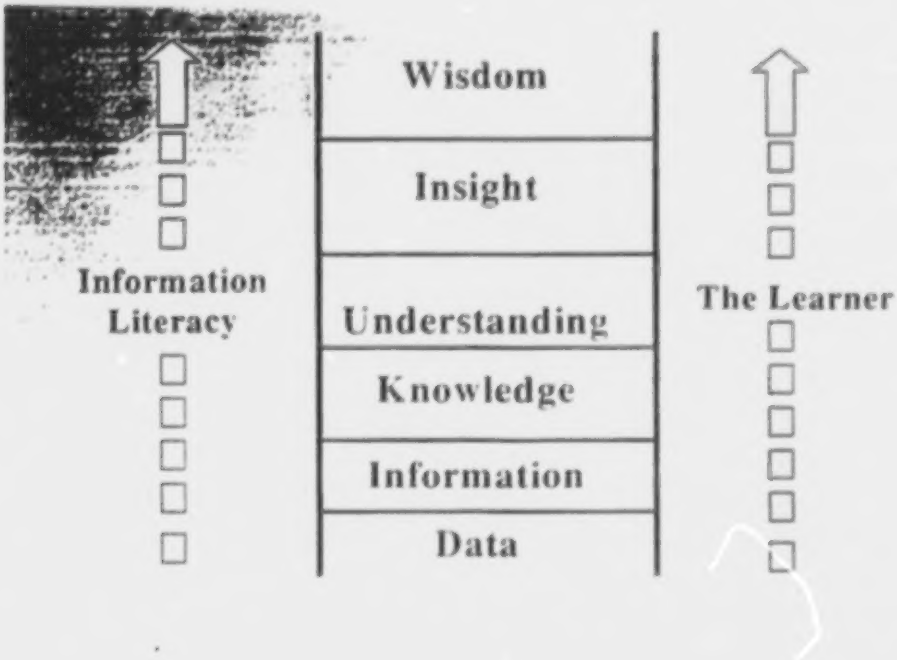
The central theme of Bruce's work presents the *seven faces* of information literacy. This set of conceptions provides a useful structure for an examination of information literacy and its linkage to lifelong learning.

Seven faces of information literacy

1. The information technology conception
2. The information sources conception
3. The information conception
4. The information control conception
5. The knowledge construction conception
6. The knowledge extension conception

5 The knowledge construction conception
6 The knowledge extension conception
7 The wisdom conception

When considering this set of conceptions, I was struck by its similarity to what I call the *wisdom ladder.*



This ladder clearly depicts the way in which the learner can apply information literacy skills as a key lever assisting growth and development in the pursuit of wisdom and a high degree of philosophical competence. Among the many papers seeking to link lifelong learning and information literacy, three have been chosen for illustrative purposes. These three papers are *Foundations for the future; a declaration for education and children's services in South Australia, The national goals for schooling in the 21st century,* and the Australian National Training Authority publication *A national marketing strategy for skills acquisition and lifelong learning.*[2-4]

In *Foundations for the future* we see the strengthening of the importance of the early years and lifelong learning. We see the strengthening of the importance of the use of technology to amplify the extent and transform learning. There is also an emphasis on the development of those skills that are needed to engage in lifelong learning, skills that are part of information literacy.

Foundations for the future declares that

- We affirm the essential importance of the early years in establishing the foundation for emotional well being and lifelong learning
- Our students must have the motivation and skills to engage in lifelong learning and be able to approach the future with optimism, purpose and the capacity to contribute to the development of their society
- We will focus on the use of technology to amplify, extend and transform learning.

In April 1999 MCEETYA approved a revision of the *National goals of schooling,* known as the *Adelaide declaration.*[5] This is an important document, but unfortunately it did not refer to information literacy. However, there are lots of sections that one could say link fairly closely, such as problem solving and the ability to communicate ideas and information, and the need to be confident in creating the productive use of new technology, particularly information and communication technology.

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The Adelaide declaration states that

1 Schooling should develop fully the talents and capacities of all students. In particular, when students leave schools they should
    1.1 have the capacity for, and skills in, analysis and problem solving and the ability to communicate ideas and information, to plan and organise activities and to collaborate with others
    1.2 be confident, creative and productive users of new technologies, particularly information and communication technologies, and understand the impact of those technologies on society.

2 In terms of curriculum, students should have
    2.2 attained the skills of numeracy and English literacy; such that, every student should be numerate, able to read, write, spell and communicate at an appropriate level.

The Australian National Training Authority has released background papers associated with its *National marketing strategy for skills acquisition and lifelong learning* that have included information literacy as the third of the ten key dimensions of this piece of work.

1 Lifelong learning is fundamental to security and confidence in the knowledge economy.
2 The concept of learning has four main dimensions – knowledge, process, attitude and value.
3 *There is a growing premium on information literacy and a growing demand for enterprise soft skills.*
4 Australians place a high value on skills and learning, but not necessarily on education and training.
5 The impact of schools and families.
6 Australians need to put the personal and intrinsic value back into the learning experience.
7 The link between the global and the local.
8 A focus on networks and leadership.
9 The VET system is well placed – even uniquely placed – to respond quickly and effectively to what the market is saying it wants.
10 And finally the research identifies a significant number of barriers and incentives to learning.

The people in this room know how fundamental and basic literacy is as a vehicle for learning and as a goal in itself. The participants at this conference are the converted, the inspirers and the leaders. I have read the proceedings of the 1992 and the 1995 conferences and I commend you for blazing a trail for others to follow in information literacy so that we can provide national and global leadership.

Information literacy is fundamental because it is

- a prerequisite for participative citizenship
- required for the production of new knowledge, on which the future economic success of all countries depends
- needed to address global problems which challenge the planet and the survival of civilisation.[6]

This focus on global issues and citizenship draws me to a very sad moment in referring now to the work of my good friend and colleague, Robert Theobald, who sadly died on Saturday in Spokane. He was working at our Centre for Lifelong Learning only a couple of weeks ago and was intending to return as an Adjunct Professor with us, next year. We are very sad about his death because Robert taught us so much about preparing us for the 21st century and he is not even going to be here to experience the new century.

One of the challenges that Robert put to us as a key to the 21st century is the enabling of 'access to the needed information and knowledge, the needed knowledge and wisdom'. Robert made the point that 'people need to be able to find information and they need to make sense of their own context and realities'. For any of you who have not had the pleasure of reading Robert's works, I encourage you to do so, because although Robert's body has left us, his spirit is with us and his teachings will influence our work for a long time. In fact, there are twelve people who have formed a group at our Centre to continue the examination of the relevance of Robert Theobald's teachings for their own growth and for the benefit of South Australia.[7]

In her assessment of learners' needs for the 21st century, the Vice Chancellor of the University of South Australia, Professor Denise Bradley, described a repertoire of information skills when she explained how 'learners must engage actively in problem solving and must develop and use a repertoire of information gathering and information sifting skills if formal education is to prepare them for an uncertain future'.[8]

The concept that readily comes to mind in linking information literacy and lifelong learning is indeed learning to learn, because

> Ultimately information literate people are those who have learned how to learn. They know how to learn because they know how information is organised, how to find information, and how to use information in such a way that others can learn from them.[9]

Learning to learn

People know how to learn because they know how information is organised, how to find information and how to use information and so forth. According to Alan Bundy 'information literacy is the key enabling competency in our information and learning society'.[10] And as Professor Bradley so aptly put it, 'today's learners must learn how to find, sift, evaluate and present information'.[11]

Of course, there are many other things that have been written about learning to learn and there is not time to deal with all of those here this morning. Turning now to the links between information literacy and lifelong learning, I agree with Candy and others that

> Information literacy is a key characteristic of lifelong learners (and) ......access to and critical use of information is absolutely vital to lifelong learning, and accordingly no graduate – indeed no person – can be judged educated unless he or she is information literate.[12]

Farmer's claim[23] that 'information literacy is emerging as one of the most critical literacies for an educated person in the 21st century' is supported by Radomski's view that 'learning to be information literate through active exploration and practice is one way of enabling our students to prepare for the journey of continuous lifelong learning'.[14]

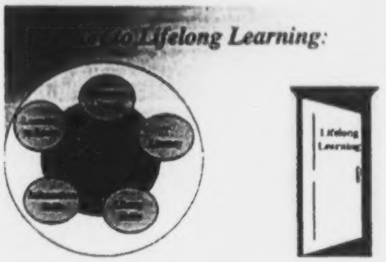
Learning to be information literate through active exploration and practice is one way of enabling our students to prepare for the journey of continuous lifelong learning. The librarians, resource leaders and the leaders in the information literacy movement in this state, people like Anne Hazell and Di Booker, have long held the view 'that information literacy is the primary building block for lifelong learning'.

The core of my comments today is the very strong role for information literacy as a fundamental building block of lifelong learning.

If we are to achieve our vision for lifelong learning then we will need some changes in the educational paradigms and learning culture.

> The creation of a learning culture which produces graduates with a capacity and desire for lifelong learning in a rapidly changing, complex, and information abundant environment, requires a major shift in the educational paradigm.[15]

The links between information literacy and lifelong learning are illustrated in the diagram below which shows the components of the information literacy key which will open the door of lifelong learning for everyone.



Discussion about keys reminded me of the need to make sure that we have all the correct tools in place to help people access lifelong learning. This point was made clearly by the Ministerial Council for the Information Economy in 1998 in its statement that

> Our education system must provide the tools for lifelong learning so that all Australians are able to benefit from the changes happening around them. This commitment will embrace all levels of education and training, from schools to workplaces.[16]

I assume that participants at this conference are devotees and very happy indeed to be associated with information literacy being hand in hand with lifelong learning. It is not so everywhere. Of course there are some sceptics around such as McCranck, who claim information literacy is 'an abstraction, an unachievable, if noble goal'.[17]

You can take out the word information literacy from McCranck's criticism and put in lifelong learning. A lot of people say to me that this is nonsense. How can you have lifelong learning for all? It is an abstraction, it is unachievable, and it might be noble we cannot achieve it, so why are you running down that path?

Ivan Illich challenged a lifelong learning conference in Bremen with his views of lifelong learning when he said

> So far I have treated the babble about lifelong learning as a mere slogan used by unemployed teachers on the look out for jobs in industry, commerce and politics……I took the whole thing as a fantasy of pedagogics gone wild. Here we have before us a group of seemingly intelligent people devoted to this gibberish.[18]

Those of us who are dedicated to lifelong learning as opening the pathways to everything that is honourable, can tend to overlook those people who think the notion of lifelong learning sounds more like a prison sentence and that they are going to be locked away for an endurance test of some kind, rather than an invitation to pleasure, achievement and progress.

Whenever you get into the business of defining lifelong learning you run into the same business that you run into with information literacy as no definition is all embracing enough. Therefore ELLI (The European Lifelong Learning Initiative) ended up with a very long definition that wins the award for trying to satisfy everyone's ideas.

> Lifelong learning is…. the development of human potential through a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes and to apply them with confidence, creativity and enjoyment in all roles, circumstances, and environments.[19]

Of course we know that lifelong learning is many things and the concept serves as a

- statement of vision
- focus for action
- gel for coherence
- means towards social justice

- stimulus for new partnerships
- motivator for orientation change from institutions to learners and learning
- call for participation
- unifying concept for a better world
- acceptable link for education and the economy

It is a good thing that information literacy is linked to lifelong learning, because this concept seeks to cover everything. No wonder a scholar like Phil McKenzie, an expert in the field of lifelong learning and employment, has said that he thinks this is one of the most powerful concepts and ideas for the 21st century.

> The power of the idea is evident in the observation that is now increasingly made that lifelong learning represents as significant a social and economic shift for the late 20th century as the introduction of compulsory schooling had been for the 19th century.[20]

People like Jaques Delors[21 22] have claimed that the four pillars of learning will set the foundations for lifelong learning for all. These four pillars are

- Learning *to* ***KNOW***
- Learning *to* ***DO***
- Learning *to* ***LIVE TOGETHER***
- Learning *to* ***BE***

The links from the information literacy literature to the work of Delors are strong indeed.

We know that lifelong learning is going to be essential for everyone as we move into the next millennium. We know that it is a policy guide and the rhetoric needs to become a reality. There are so many ways in which this concept can influence the way that we work and particularly with respect to the requirements of learning to learn.

The key to improving lifelong learning, making it a reality for all, is firstly getting the foundations right. If we do not get the foundations right in terms of early years learning, then the rest of lifelong learning will not be the success that we want it to be.

> Lifelong learning would be essential for everyone as we move into the 21st century and has to be made accessible to all.[23]

This new concept of lifelong learning has several key features

- the centrality of the learner and learner needs; that is, an orientation towards the demand side of education and training rather than just the supply of places
- an emphasis on self directed learning, and the associated requirement of learning to learn as an essential foundation for learning that continues throughout life
- a recognition that learning takes place in many settings, both formal and informal
- a long term view, that takes the whole course of an individual's life into consideration.

We need to recognise the importance of effective transitions in learning, as we move from conception through to birth, from birth to schooling, from preschool to school, primary to secondary, secondary to university or work or TAFE, changing jobs eight or nine times across a lifetime and then moving into that new world of the third age and increasingly the fourth age. Lifelong learning requires the development of new roles for all parts.

Achieving the goals of lifelong learning will require us to

- improve the foundations for lifelong learning
- recognise the importance of effective transitions
- rethink the roles of all partners – form new alliances

A friend of our Centre is Jarl Bengtsson, who is Head of the Centre for Educational Research and Innovation at the OECD, and he has said that 'Lifelong learning is a fundamental pillar to make a knowledge economy a reality'.[24]

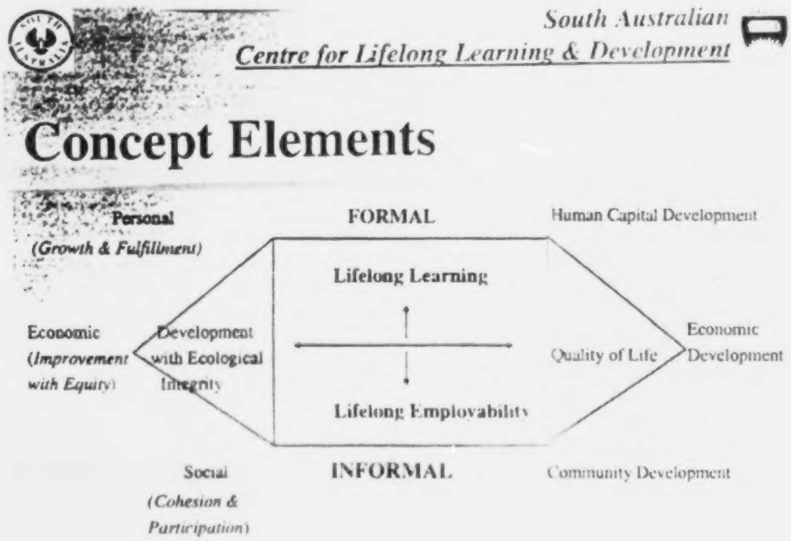
Whenever you look at matters relating to lifelong learning, it is important to recognise the contextual factors as set out below. Within the context of this discussion this morning, I am only going to touch on the second one, the knowledge economy, because with the developments that have occurred as we move through the agrarian age through the industrial revolution, through the manufacturing era, into the information age, and as we move now into the knowledge economy, we know that information literacy and lifelong learning are going to be of vital importance with regard to those matters.

- Demographic
- Knowledge economy
- Pace of change
- Exclusion and polarisation

It is because of this awareness, that in South Australia we have created a unique Centre which is committed to knowledge about learning and learning for knowledge, and a commitment to learning to learn across the lifespan.

There will not be time for me today to be able to explore all the dimensions of the work of our Centre. Our Centre is working at linking information literacy and lifelong learning. We are seeking to look at all dimensions of lifelong learning. The personal dimensions in terms of personal fulfilment and personal growth; the social dimensions in terms of social cohesion and social participation; and the economic dimensions in terms of growth, equity, ecological integrity and others.

The diagram below presents the broad remit of the Centre.


South Australian
Centre for Lifelong Learning & Development
Concept Elements
Personal
(Growth & Fulfillment)
FORMAL
Human Capital Development
Lifelong Learning
Economic
(Improvement with Equity)
Development with Ecological Integrity
Quality of Life
Economic Development
Lifelong Employability
Social
(Cohesion & Participation)
INFORMAL
Community Development

In 1999 the Government of South Australia published a set of directions for South Australia, and lifelong learning is at the heart of the strategies for the direction of this State and stated that the recently established Centre for Lifelong Learning will provide leadership in developing opportunities for lifelong learning for South Australians.

Our Premier and our Government, are the only State leaders in Australia to have made such a forthright commitment to lifelong learning and they have created this Centre to fulfil a whole range of functions that will address these matters and as you can see, they are far reaching and very promising indeed.

The Centre's functions include the

- advancement of knowledge
- coordination of initiatives

- management of projects
- leadership of programs
- identification of needs
- motivation of community
- provision of policy advice

At this point the Centre has developed a wide range of connections with people, and partnerships, locally, nationwide and internationally.

Dr Jarl Bengtsson of the OECD has reported that

- There are still too few institutions like the SA Centre for Lifelong Learning in the OECD
- I expect that in the next ten years there will be one, two or three in every OECD country
- This is the future: learning centres and lifelong learning and we will see much institutional creation in that area.[25]

As the famous anthropologist Margaret Mead said 'we are all immigrants into a new time'. In my view, it is a new time which will be enriched by lifelong learning. In my view, lifelong learning is achievable through information literacy. The future is getting every citizen of our country information literate. The goal of our country, is to make sure that lifelong learning is for all.

It is my pleasure to officially open this National Information Literacy Conference, *Concept, challenge, conundrum: from library skills to information literacy*. And in doing so I commend the Convener, Irene Doskatsch and the organising committee and wish you all a most productive and enjoyable conference as you pursue deepened understandings of information literacy on your lifelong learning journey.

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WHAT ALL LIBRARIANS CAN LEARN FROM TEACHER LIBRARIANS: INFORMATION LITERACY A KEY CONNECTOR FOR LIBRARIES

Ken Haycock
University of British Columbia

Professor Haycock gave the conference keynote address using several overhead transparencies which are not included here. He can be contacted at ken.haycock@ubc.ca. Professor Haycock's visit to Australia was sponsored by Infosentials

My task in this paper is to synthesize the research in information literacy in the K-12 sector, particularly as it relates to successful implementation of programs, to integrate this research with recent studies in information literacy in academic libraries, and to propose means for moving the post secondary information literacy agenda forward. Of course, some of the research is contextual and tentative such that these might best be considered propositions for further study. Having said this, however, these assertions are not simply personal opinion or preference, or reflections of a personal belief system, as is too often the basis for our decision making.

There is sufficient evidence from the research in teacher librarianship to suggest that under certain conditions, a qualified teacher librarian does have a positive effect on student achievement. My intention is to review this research base and to propose implications for academic librarians in postsecondary or tertiary institutions.

The sources for this analysis are primarily research studies and syntheses of research completed by Haycock,[1-3] Krashen,[4] Lance and others[5] and Loertscher and Woolls.[6]

I should also like to recognize here and thank for their contributions to this field seven Australian colleagues in particular, in order of length of my relationship with them—Roy Lundin, Anne Hazell, Maureen Nimon, James Henri, Ross Todd, Di Booker and Christine Bruce.

In 1968, more than thirty years ago, Woodworth[7] found that both researchers and practitioners agreed that the five areas requiring most attention for research in school librarianship were instruction, services, publicity, accessibility and use, and budget—all areas of current concern. Similarly, Jetter,[8] twenty five years ago, in an examination of future needs based on a Delphi study of leaders in education and teacher librarianship, concluded that the teacher librarian of the future, that is, today, would function as an instructional development specialist but that new programs of education for teacher librarians would be required, particularly interdisciplinary approaches, as well as supportive educational environments for implementation. Not much has changed today.

Several studies have examined the impact of school libraries and teacher librarians on student achievement.[9,10] In a study sponsored by the Colorado Department of Education[11] the researchers found that, among school and community predictors of academic achievement, the size of library staff and collection was second only to the absence of at risk conditions, particularly poverty and low educational attainment in the adult community. Stephen Krashen[12] provides an excellent overview of the research on reading motivation and achievement, less a service priority in academic libraries than in schools regrettably, and makes clear that students increase their accuracy and ability from reading; the purpose of teaching reading skills is solely to make the text more comprehensible and to edit writing. Reading, especially its long term development and grade level achievement, is enhanced through a print rich environment, a well stocked school library and a full time teacher librarian.

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Perhaps more emphasis has been more on these results than on the factors that led to them. For example, the teacher librarian is more likely to have an impact if he or she is certified, that is, qualified in teacher librarianship, trained in collaboration with classroom colleagues, actually collaborates as an equal teaching partner, and maintains an active involvement in the instructional program.

How does this relate to the situation in academic librarianship? In a descriptive review of the state of the art in Canadian schools, colleges and universities, Frick[13] described in 1988 the different instructional methods used in postsecondary or tertiary institutions. Reflecting the context of the times, the lecture method was considered the most economical (without any analysis of impact on achievement, however), no programs were course integrated, ninety per cent of the evaluations conducted were informal, and undertaken solely by librarians, and most of the programs were one time only sessions. Some programs were described as highly effective or excellent but again with no analysis of effect.

From 1988 to 1996 more than a thousand doctoral dissertations were completed in Library and Information Studies in North America.[14] In a comparison of those completed in school librarianship and those in academic librarianship, studies of the role of the teacher librarian tended to focus on effectiveness, while studies of the role of the academic librarian tended to focus on faculty status, race and ethnicity, boundaries of work and continuing professional education. Similarly, those studies completed in primary and secondary institutions examined the role of the library and the effectiveness of the librarian in terms of impact on student achievement and on the school as a whole while the research in tertiary institutions focused on the students and what they already knew (as a basis for developing tests), the use of technology in instruction (compared to print) and how to organize and deliver instruction using different formats (lecture, video, LCD, CAI).

Criteria for success

From the research in teacher librarianship in primary and secondary schools then one can postulate, with some degree of confidence, the basis on which a program is more likely to succeed, that is, more likely to have a positive impact on student achievement. These will be summarized here, explained for school environments and examined for their implications for tertiary institutions.

Successful programs have a statement of purpose or mission so that administrators, staff and students are aware of the ends to which funding has been allocated. The program is recognized as a partnership, a partnership of administrator, teacher, teacher librarian and district and state authorities.

The role of the teacher librarian has been clarified to focus on collaboration and the integration of information literacy with classroom instruction; successful classroom teaching experience is required for this role, and education programs to prepare teacher librarians' need to build on this teaching background.

Administrative support is necessary and specific behaviors by administrators enhance program development and implementation. The organizational culture consequently values collaboration among faculty and encourages it. Guidelines and policies support the focus on collaboration, flexible instruction and the integration of information skills and strategies with classroom programs.

An information process model has been developed and adopted by the faculty and a continuum of skills and strategies is in place to enable improved planning and teaching. Assessment and evaluation consider both process and product.

These prerequisites or scaffolds for success exist in enough locations to suggest that they are neither unreasonable nor unrealistic.

It is clear from these studies that course integrated instruction is the more effective means of affecting student achievement. It is also clear that these criteria are more likely to ensure success. Do they apply to academic libraries as well? According to Taylor[15] who studied three colleges with well regarded information literacy programs, gradated from freshman to upper level classes, these factors were common to all: there was a commitment and skilled leadership that led to faculty acceptance, there was faculty interest and support, there was leadership by the librarians, the curriculum required library use, collection development was undertaken with faculty involvement, and administrative support was demonstrated in both human and financial terms.

Statement of purpose/mission

A mission statement serves as the filter for decision making as it is the declared purpose of the library. In the school library, it is common for the purpose to be 'to enable teachers and students to become effective users of information and ideas'. Consider the difference between these two statements for an academic library:

[1] to provide exceptional access to the world's knowledge; or,

[2] to enable faculty and students, and each individual, to access and make effective use of the world's knowledge.

The former does not make clear the nature of the access, suggesting a limitation to physical access, that is, making it easier to retrieve the information from the shelf or to bring it up on the screen; the latter, on the other hand, does make clear that teaching successful search strategies and enabling intellectual access, that is, deriving meaning from the text, are also considerations for quality library service. Passivity in terms of interaction with the user is inherent in the former; teaching and intermediation are inherent in the latter.

The mission statement makes visible our intentions and these can vary considerably with just a few words. In other words, developing information literate students is more likely when it is a clearly stated intention.

Role clarification

There are many misconceptions about the role of the teacher librarian such that study after study tells us that an essential first step to improvement of school library programs is clarification for the role of the teacher librarian. The principal, teacher and teacher librarian often have different views of roles and priorities. Even those teachers who commit to collaboration with teacher librarians initially see the role as a service and support function while the teacher librarian sees it as an equal teaching partnership; the teacher librarian needs to be an exceptional negotiator.

The Association for Teacher Librarianship in Canada and the Canadian School Library Association,[16] in providing support and direction for schools and educational agencies, specify these professional competencies for the teacher librarian

- places a priority on staff relationships and leadership in the implementation of change
- provides leadership in collaborative program planning and teaching to ensure both physical and intellectual access to information and commitment to voluntary reading
- knows curriculum programs mandated by the province, district and school
- understands students and their social, emotional, and intellectual needs
- has expert knowledge in evaluating learning resources in different formats and media, both onsite and remote, to support the instructional program
- develops and promotes the effective use of informational and imaginative resources in all formats through cooperative professional activities
- provides appropriate information, resources or instruction to satisfy the needs of individuals and groups
- uses appropriate information technology to acquire, organize and disseminate information
- manages library programs, services and staff to support the stated educational goals of the school
- evaluates program and services.

On a personal level, the teacher librarian

- is committed to program excellence
- seeks out challenges and sees new opportunities both inside and outside the library
- sees the big picture
- looks for partnerships and alliances
- creates an environment of mutual respect and trust
- has effective communications skills
- works well with others in a team
- provides leadership
- plans, prioritizes and focuses on what is critical
- is committed to lifelong learning
- is flexible and positive in a time of continuing change.

Each of these is illustrated with examples.

Some school districts, such as West Vancouver in British Columbia,[17] have endorsed these statements and placed them in the broader context of policies and propositions about information technology.

Teacher librarians who are less cautious and more extroverted also tend to be more successful. They demonstrate 'tough poise'. Circulation of materials increases when the teacher librarian demonstrates more extroverted behaviors and greater curricular involvement. Similarly, as personal relationships increase as a priority, services increase.

Exemplary teacher librarians mirror the characteristics of exemplary teachers, according to school principals, but offer a 'mirror plus', value added competencies and services.[18]

The alternative is poor role definition, which leads to poor evaluation processes as there are no clear criteria for accountability.

It will be no surprise to any academic librarian that there are differing perceptions of the role of the academic librarian as well and there needs to be greater clarification, especially for the role of the liaison librarian.[19] Collection development and instruction are also critical to the role of the academic librarian but not practised widely.[20]

Librarians who are not in positions of management describe their roles primarily as cataloguing, reference and/or collection development but each of these included elements of learning, teaching and training; librarians, however, saw these instructional roles as implicit in their librarian roles but the others saw them as quite separate.[21]

If teaching roles are to be realized, academic librarians will need to address their general lack of skills in instructional design, in teaching methodologies, and in measurement and evaluation.[22] Perhaps not surprisingly, librarians also prefer to work with individuals than with groups.[23] Bibliographic instruction librarians, in particular, need educational course work.[24]

Partnerships

Successful programs are recognized as partnerships, of the school principal, who can exercise influence, of the teacher, who controls curriculum and program delivery, of the teacher librarian, who initiates collaboration if it is to occur, and offers expertise in information resources and their use, and of the school district or state agency, which provides policy frameworks and funding support.

The principal is the key factor in developing any program as that is the person who can offer material and intellectual support to the teacher librarian. The principal is also usually closer to the teacher librarian on conceptions of role than teachers are; the principal is typically more positive about integration of information literacy in classroom programs, for example.

For teacher librarians, there must be joint responsibility with the principal for program development and acknowledgment that collaborative program planning and teaching (CPPT) is a complex innovation that will need to be tied to the principal's own agenda.

We know that principals have no knowledge of teacher librarianship from prior administrator education. They need to be knowledgeable enough, however, to be able to link CPPT to other innovations. Principals who have a positive impact on school library programs are willing to take risks, offer strong leadership, have problem coping skills, make considered resource allocation and clearly communicate their expectations, which in turn lead to changed teacher behaviors. For example, in schools where principals expect teachers to plan together and collaborate on instruction, it should come as no surprise that this actually happens, whereas in schools where this is not an administrator expectation, it is less likely to happen.[25] The role of the principal is enhanced by the leadership of school district coordinators and teacher leaders in the building.

These behaviors are of course reflections of organizational culture, a phenomenon only recently studied in the research in teacher librarianship. There is, for example, higher academic achievement in schools where teachers collaborate and where there is more instructional cohesiveness. Unfortunately, collaborative work environments, which everyone wants, lead to greater conflict, which no one wants. The issue thus becomes one of developing a problem solving culture where issues can be raised, debated based on evidence and resolved for improved student learning. Too often we take the safe route and confuse congeniality with collegiality and make decisions based on expediency and harmony alone.

For the teacher librarian to be successful, then, leadership must be shared and the teacher librarian needs the personal stamina, energy and enthusiasm to see CPPT from initiation through to implementation. Teachers and principals need to understand CPPT, flexible scheduling (scheduling based on planning and need, not simply to provide relief for classroom teachers) and their benefits and must be trained to a level of comfort with practice and sense of ownership.

One suspects that deans and directors can have a similarly positive effect on collaboration between librarians and faculty through the same means: strong leadership; clear expectations; risk taking; reallocation of resources. Similarly, academic librarians, one suspects, might be more successful in working with deans and directors if they demonstrate a commitment to collaboration, personal stamina and energy and ability to tie information literacy to administrator agendas.

District and state coordinators and consultants can also have a positive effect, but they too suffer role conflict; they tend to have high expectations for themselves but are not as involved in curriculum matters and public relations as they should be or could be. As their level in the hierarchy of the organization increases so too does their effectiveness. Draw your own comparison to the head of your library's instructional program.

School superintendents and directors support the need for school libraries and teacher librarians, generally understand their impact but simply have other priorities. We also face the peculiar administrative disease known as technolust which is clouding much rational thinking at this time. Does this ring true, for example, for your provost?

Guidelines/policies

Written guidelines and policies can frame much of the work of the teacher librarian. Proposed policy has a much better chance of being approved if it is related to existing programs and reflects best practice. Policy requires clarity so that decision-makers understand the language of the subculture; in other words, a policy statement using library jargon has far less chance of successful adoption than one that does not. Adoption is also facilitated if the practice, such as CPPT and flexible scheduling, is understood by the superintendent and school board and if they allocate funds to its implementation. Again, one might postulate that tertiary level information literacy programs would be more successful if they are written in university academic plans and if they reflect existing programs.

Associations can play an active role in improving standards of service. As a minimum professional associations speak with a unified voice and provide leadership and professional continuing education. By way of example, the American Association of School Librarians[26] developed standards for student information literacy, guidelines for the effective programs that lead to meeting these standards and a plan for implementing the standards and guidelines through focused training and support throughout the United States.[27] The AASL also collaborates with the Association of College and Research Libraries as it develops standards and guidelines for postsecondary programs.

Integration of what? (The language issue)

What is it exactly that we are working to integrate into instructional programs through collaboration with faculty? We have moved from the term *library skills*, or at least one hopes that we have, which tended to refer to how to find the book, to reference skills and research skills, which suggest use of specific types of materials and for specific purposes, to *research and study skills* which indicates that there are strategies involved in remembering the information located, to *information skills* and *information strategies*, which acknowledges that there are specific tasks and approaches that lead to greater success in using the information at hand, regardless of format, for an intended purpose, sometimes called information based problem solving. And now we have moved to *information literacy*, in part perhaps to ensure that we are seen as part of the burgeoning literacy movement.

Representative types of literacy have been identified as: academic literacy, adult literacy, advanced literacy, autonomous literacy, basic literacy, biliteracy, community literacy, computer literacy, craft literacy, critical literacy, cultural literacy, cultured literacy, economic literacy, emancipatory literacy, emergent literacy, family literacy, functional literacy, high literacy, ideological literacy, intergenerational literacy, marginal literacy, media literacy, minimal literacy, polyglot literacy, pragmatic literacy, prison literacy, protoliteracy, quantitative literacy, reading literacy, real world literacy, restricted literacy, scribal literacy, survival literacy, television literacy, vernacular literacy, visual literacy, workplace literacy.[28]

But what is literacy? Simply stated, it is the ability to derive meaning from a source, whether visual, textual or social, among others, and to share that meaning with others.

Information literacy has been defined as

> the ability to: recognize the need for information to solve problems and develop ideas; pose important questions; use a variety of information gathering strategies; locate relevant and appropriate information; access information for quality, authority, accuracy and authenticity. Includes the abilities to use the practical and conceptual tools of information technology, to understand form, format, location and access methods, how information is situated and produced, research processes, and to format and publish in textual and multimedia formats and to adapt to emerging technologies.[29]

Much to integrate with programs overall, let alone with one assignment!

The American Association of School Librarians developed nine information literacy standards for student learning, each of which has grade level proficiency and assessment indicators.

> *Information literacy*
> *Standard 1:* The student who is information literate accesses information efficiently and effectively.
> *Standard 2:* The student who is information literate evaluates information critically and competently.
> *Standard 3:* The student who is information literate uses information accurately and creatively.
> *Independent Learning*
> *Standard 4:* The student who is an independent learner is information literate and pursues information related to personal interests.
> *Standard 5:* The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.
> *Standard 6:* The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.
> *Social Responsibility*
> *Standard 7:* The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.
> *Standard 8:* The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.
> *Standard 9:* The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.[30]

Recent research suggesting the need for gradated instruction of increasing sophistication over the years of schooling reinforces these principles of 35 years ago

> Skill instruction should be presented at increasing levels of difficulty, moving from the simple to the more complex; the resulting growth in skills should be cumulative as the learner moves through school, with each level of instruction building on an reinforcing what has been taught previously. Students should be helped, at each stage, to generalize the skills, by applying them in many varied situations; in this way, maximum transfer of learning can be achieved.[31]

Tied with this is the need for an information or research process model that incorporates discrete skills and strategies into a plan and process for successful learning. There are several different models available in the literature, some based in practice and some in research, but these need to be discussed and debated by faculty and teacher librarian to determine which best meets their needs for teaching and learning. The elements of each are common: what does the students need to do [formulation or definition of the task]? where can they go for the information? how do they get to the information? what resources should they use? how shall they use them? what do they need to make a record of? how do they know when they have the information they need? how shall they present it? how do they assess achievement? Most models reflect primary research conducted by the British Library twenty years ago.[32]

Research in information literacy, and particularly this research process, offers strategies for improving student learning through collaboration by teachers and teacher librarians. In their excellent summary of research in information literacy, Loertscher and Woolls,[33] for example, found that successful use of search engines by young people requires content knowledge, appropriate language skills and adult intervention. The quality of materials made available, and their attributes (sound, color, graphics), can also accelerate student learning. Students typically need more time to 'consume and absorb' the information they find than they are given. Synthesis — especially summarizing and making decisions rather than copying someone else's ideas and conclusions — must be taught to students in order for them to apply and use this skill set. Just as the use of search engines is not intuitive, neither is synthesis, in spite of the instructional decisions made to the contrary.

Promising techniques for teacher librarians to impact student achievement, in addition to planning to address the above findings, include cooperative learning, cultivating habits of mind, constructivist strategies, integration of information skills and content, collaborative planning, flexible scheduling, developing one's own research model based on others available, teaching text structure, and engaging the school principal in understanding and support for integrated information literacy programs,[34] conclusions replicated in many studies.

Assessment — whether through checklists, rubrics, student conferencing, journals or portfolios — must be aimed at improving student growth and instruction; in other words, assessment leads to recognition of student accomplishment and to modification and improvement of our programs. Fortunately, a wider variety of newer assessment techniques provide opportunities for developing a multidimensional view of what students know and are able to do.[35]

Collaborative planning and teaching

We have years of study to indicate that isolated skills lessons are not effective, not even when they are related to a topic of study; they need to be integrated with classroom instruction in a planned and flexible manner. Indeed, the National Council for the Social Studies first stated in 1963

> The skill should be taught functionally, in the context of a topic of study, rather than a separate exercise...The learner must understand the meaning and the purpose of the skill, and have motivation for developing it. The program of instruction should be sufficiently flexible to allow skills to be taught as they are needed by the learner; many skills should be developed concurrently.[36]

The case for collaboration is now beyond dispute in schools. As with the information process, there are models for improved collaboration with faculty.[37]

And are these issues similar in academic institutions? It would seem so.

Since Frick's 1988 review,[38] there has been a shift from questioning whether to engage in instructional programs to integrate information literacy to questioning what constitutes an effective program.[39] And while greater use of support staff is becoming common, particularly to free professional librarians for management and liaison, the one area not being assigned to trained support staff is instruction.

We know that some faculty do teach the use of electronic resources but they tend to recommend what they use; they also prefer librarians to teach but this desire is uneven across faculties.[40] When faculty do give library based assignments, even written instructions lead to better research.[41]

In spite of what we know about the importance of collaboration, however, we keep seeking validation for our preferred methods: one shot lectures and one on one reference and instructional assistance. In one study comparing individual assistance on request with two lectures and a workbook, there was no difference in effective use;[42] the researcher concluded that there were 'probably other benefits'; comparing typical reference services with course credit, there was no difference. Still another found no difference between isolated instruction and no instruction at all but concluded that it must be 'better than nothing'.[43] Self instructional modules were also not as effective as hoped; the researcher concluded that an integrated program was necessary.[44]

Of course, for the students the problem is not their own inadequate search ability but rather perceived inadequacies in the library's collection.[45]

Bringing together the questions of research versus practice, and evidence-based models of instruction versus personal preferences for isolated instruction, is a study of two different teaching methods, the traditional approach and a cognitive strategies approach, in which several differences were noted.[46] The cognitive strategies approach is process oriented, integrates skills, teaches metacognition (self monitoring) and affective skills for self motivation. The researcher compared effects on the research process (drawing on the work of Kuhlthau), library anxiety (the work of Mellon) and student performance on complex problem solving tasks of research, preparing a research bibliography, formulating the topic and topic development, and perceptions of usefulness and attitude. The cognitive approach was more successful on all indicators except the last two. In other words, students performed better on research, the research bibliography, formulating the topic and topic development but their perception of usefulness and attitude were no better. And, of course, our evaluations tend to be based on these perceptions of usefulness and attitude.

Further, implementation of a model based on the characteristics of effective user education was impaired by policies within the library and within the academic institution in regard to the education of independent learners.[47] Australian librarians' ideas matched the characteristics of independent learning more than their practice due to a lack of understanding of theories that could underpin practice; indeed, most librarians were unaware of the theories and requirements of independent learning education. Librarians placed high priority on cooperation with faculty for effective user education programs but did not recognize cooperation as a factor in success; they did see lack of cooperation as an obstacle, however .[48]

Conclusion

We can expect that academic libraries will be used more in the future whether on site or remotely and that information literacy will become a critical, if unacknowledged, component of advanced education. More and more programs are moving to problem based learning, evidence based assignments, cooperative and team activities and authentic assessment. Each of these requires the effective use of recorded knowledge and ideas.

Students, however, do not use instructional programs that are offered on a voluntary basis and removed from classroom instruction; they are too busy and do not see any immediate need.

If we are serious about implementing information literacy programs we need to start with the construction of assignments and the instruction provided for their effective completion. That means that we start with faculty colleagues.

If we follow the directions evolving from research in the primary and secondary school sectors, much of it reinforced through research in tertiary institutions, we will act on those areas over which we have control and plan for those over which we do not. We would start with a statement of purpose or mission for the library that emphasizes information literacy development through collaboration and instruction, we would recognize that the program is a partnership of administrators, faculty, librarians and academic authorities, we would clarify the role of the academic librarian, particularly the liaison and instructional staff, and work toward administrative support and a culture that values collaboration between faculty and librarians and encourages it, we would ensure that training was available for effective collaboration, develop guidelines and policies that support a focus on collaboration, agree on an *information process model* developed and adopted with faculty and a gradation of skills and strategies. Assessment and evaluation would consider both process and product.

Information literacy is critical to student success. The guideposts for successful implementation of effective information literacy programs in tertiary institutions are clear. Their attainment, however, will require considerable time, leadership and resources reflecting a partnership of librarians, faculty and administrators.

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INFORMATION LITERACY: CONCEPT, CONUNDRUM, AND CHALLENGE

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Information literacy has captured the imagination of many librarians, educators and researchers across Australia. Take a moment to visit the home pages of many Australian libraries and information agencies – school libraries, tertiary libraries, special libraries and other information agencies. These illustrate the attention given to the concept, its embedding in the agenda of these institutions, and the importance placed on it as a distinguishing characteristic of users of information, and of the library in providing services to its users. This paper provides a broad critical and reflective overview of the Australian information literacy scene. It will reflect on the *concept*: charting the landscape and celebrating achievements; posit the *conundrum*: critiquing the present and identifying some current dilemmas: and focus on the *challenges*: constructing a future from rhetoric to reality. On the basis of this analysis, it explores approaches to grounding information literacy in a stronger theoretical framework to give it wider credibility and integrity, and identifies some possible directions for the future.

The information literacy movement has emerged in the last fifteen years as a field of academic inquiry and a focus of professional practice in the wake of notions of an information society, and an information environment rapidly moving from print to digital; from local to international; from secure to uncertain; from poverty to overload; and from service to self service. In addition, it has been stimulated by concerns about the impact of the explosion of information and advances in information technology on individuals, societies and nations. Take a moment to check out web sites such as www.schoolsucks.com, and Evil House of Cheat at www.free-essays.com, and to ponder the social, educational and informational issues embodied in these sites.

Charting the information literacy landscape

In Australia, the information literacy movement gained momentum in the late 1980s initially with the development of a range of educational policy statements that endorsed *information skills* as an important cross curricular focus in primary and secondary schools.[1] This was seen to enable 'people to satisfy their changing information needs, pursue independent lifelong learning and contribute to the development of an informed society'.[2] The information skills movement was championed primarily by teacher librarians and librarians across Australia committed to ensuring a critical role in the educational process.

This focus, at a time when curriculum initiatives centred on resource based learning, problem solving and critical thinking, represented a considerable shift from earlier emphasis on *library skills*, designed to acquaint learners with library access and retrieval systems as well as the idiosyncrasies of specific libraries and patterns of professional practice. The focus also recognised the need to contextualise the range of skills related to handling information as part of the curriculum process, rather than in isolation. The movement was strengthened and widened in the early 1990s by a number of key reports, such as the Jones Report[3] and the Meyer Report[4] which articulated key competencies related to 'collecting, analysing, and organising information' at all levels of formal education, and their role in the lives of people beyond formal education.

Three national information literacy conferences conducted by the University of South Australia Library (1992, 1995 and 1997) sought to extend the context and practices related to information literacy from that of education to a wider social, organisational and political context. The outcome has been a tentative, small moving away from an emphasis on a specific range of skills or competencies determined by expert educators and researchers to a more holistic person centred and living centred conceptualisation of information literacy and the information literate.

Three landmark publications, each at their time a state of the art view of the field in Australia, have been *Information literacy: the Australian agenda*,[5] *Learning for life: information literacy and the autonomous learner*[6] (both being proceedings of the first and second national information literacy conferences) and *The* *learning link: information literacy in practice.*[7] These important works collectively chart the history, thinking, research, practice, and advocacy relating to information literacy as an emerging concept for late 20th Century Australia. Bruce[8] provides both a historical overview and critical evaluation of the information literacy agenda, both in Australia and overseas. Significant formal research into various conceptions and dimensions of information literacy have also been published, including work by Bruce[9] [10] and Todd and colleagues[11] [12], and a range of extension and replication studies have been undertaken.[13 - 15]

A broad analysis of the Australian literature identifies a number of common threads. These are briefly outlined in terms of philosophy, definition and description, theoretical underpinnings, and the future and its challenges. In this analysis, a number of gaps are identified, and some future directions suggested.

Philosophy

Clearly underpinning the published works is the intuitive valuing of information literacy as an essential dimension to the quality of life, and individual empowerment, at least by those engaged in work that centres on information provision and dissemination. This is the central assumption of information literacy. It finds expression in the forwards, editor's notes, and introductions to these works. For example, the focus of the second national information literacy conference in Adelaide in December 1995 was expressed in terms of information literacy being 'the most critical enabling characteristic for lifelong learning and its development must be regarded as a continuum from compulsory schooling through to higher education and onto independent lifelong learning'. It is reflected as assumptions underpinning individual papers documenting research and practice. For example, Owen[16] equates information literacy with 'empowering real life'. He asserts that 'what information literacy is ultimately about, (is) empowering real life, not just a set of skills enabling us to study more effectively for the rest of our lives'. Candy, Crebert and O'Leary[17] assert that 'access to and critical use of information and of information technology is absolutely vital to lifelong learning, and accordingly no graduate – indeed no person – can be judged educated unless he or she is "information literate".'

This is echoed also in the international literature, upon which the Australian literature draws heavily. For example, in a position paper on information problem solving, the American Association of School Librarians asserts that 'information literacy ... equips individuals to take advantage of the opportunities inherent in the global information society'.[18] In an articulation of *Model information literacy guidelines* jointly published by the Colorado Department of Education, Colorado State Library and Adult Education Office, and the Colorado Department of Education, the philosophical statement is prefaced with

> Information literate students are competent, independent learners. ... Information literacy guidelines provide all students with a process of learning that is transferable among content areas and from the academic environment to real life.[19]

Similarly, Behrens claims

> The ability of the information literate person to handle information effectively will positively affect his quality of life. He has learned how to learn, is thus able to operate dynamically in his own education and therefore has control over the way in which he communicates, works and lives.[20]

The academic and professional valuing of information literacy as an essential dimension to the quality of life and personal empowerment has engendered the information literacy movement with a pervasive rhetoric and advocacy focus, a missionary zeal that continues with energy and dynamism.

The rhetoric centering on lifelong learning and independent learning is pervasive in the Australian information literacy discourse. To date it remains largely rhetoric, with only limited systematic investigation into the relationship between information literacy and independent learning and lifelong learning, and an exploration of the outcomes and benefits derived from information literacy initiatives. In a meta analysis of data collected over several years of information skills research, Todd[21] sought to establish how information literacy instruction contributes to four dimensions of independent, learning: autonomy with approaches to learning, autonomy with the content of learning, the development of intellectual skills, and the development of personal autonomy. Testing the validity of the relationship and exploring the interactions of the contributing factors are important if the rhetoric is to retain its wider credibility and persuasiveness. The reality is that in this missionary zeal, we know little about the converts.

Definition and description

A fundamental issue is what is this thing called information literacy? Despite the volume of literature about information literacy and widespread acceptance of the term, what information literacy is remains a vexed question. Langford claims that despite the plethora of literature and conferences about conceptualising and implementing information literacy, one can still ask: 'what is it I an trying to understand, let alone teach?'[22] She asks: is it 'merely an embellished view of the traditional understanding of literacy? ... Is it a concept or a process? ... a philosophy, a phenomenon, and a mere frolic with semantics'.[23] Candy also acknowledges this confusion: 'there are several different and ... incommensurable understandings of information literacy ... yet we use the same term in our communications with one another.[24] The confusion also surfaces in various attempts to explicate its definition in relation to related concepts such as library skills, computer literacy, visual literacy, critical literacy, functional literacy, social literacy, even back to basic literacy. A range of definitions and descriptions have been presented, proposed primarily by educators and researchers, which according to Bruce[25] reflect, and are encumbered by, a variety of theoretical positions such as dualism, behaviourism, information processing, constructivism, and economic rationalism.

The 1989 description provided by the American Library Association Presidential Committee on Information Literacy is the most pervasive in the Australian literature

> To be information literate, a person must be able to recognise when information is needed, and have the ability to locate, evaluate and use effectively the information needed. ...Ultimately information literate people are those who have learned how to learn. They know how to learn because they know how information is organised, how to find information, and how to use information in such a way that others can learn from them.[26]

Almost as pervasive is the 1992 definition provided by Christina Doyle, 'Information literacy is the ability to access, evaluate and use information from a variety of sources'.[27] These definitions, either being cited in toto or paraphrased in the literature, are generally not questioned, let alone critiqued in depth.

The definitions share common attributes of people centring on recognising information needs, connecting with the world of information, interacting with the world of information, and effectively putting information to appropriate use. While they are constructivist based definitions, portraying people as active, selective and discriminating users of information, they focus on attributes considered essential for people to engage actively and effectively with information. The attributes, as givens, tend to be articulated variously as sets of required knowledge, behaviours, skills, attitudes and values, and those who possess them are deemed *information literate*, and are consequently able to achieve a range of personal and learning outcomes throughout their lives. For example, according to Langford information literacy 'is a goal that can be attained through a process that relies on the continuous learning of specific and evolving behaviours'.[28] It is a cluster of activities that the individual can employ 'to cope with, and to take advantage of, the unprecedented amount of information which surround ... us in our daily life and work'.[29] In essence, possessing these attributes and being information literate adds to the quality of life and social interaction.

How do we recognise an information literate person? In the information literacy discourse there is a consistent reference to specifying a combination of concrete abilities/competencies/skills. These reflect cognitive, behavioural and affective *doings* related to connecting to, interacting with, and utilising the world of information. These *doings* have been articulated in a number of information process models, expressed either as staged or sequenced models or nonstage attribute models.[30] Typical sequential staged models include Kuhlthau's[31] model of the information process which identifies stages of initiation, selection, exploration, formulation, collection, presentation, and assessment; Eisenberg and Berkowitz's Big 6[32] which identifies stages of task definition, information seeking, location/access, information use, synthesis and evaluation; the NSW information process[33] with its stages of define, locate, select, organise, present and evaluate; and Gawith's action learning model[34] which has stages of decide, find, use, record, present and evaluate. In essence, the indicators of information literacy give emphasis to cognitive, affective and behavioural competencies as an interconnected set of literacies. The literacy part of the concept is the voice.

Nonstage models describe attributes of the lifetime ideal of a fully information literate person. These are presented as ideals to which students are to be educated in order to function appropriately and fully in an information rich world. Doyle's model,[35] Bruce's model[36] and the SUNY model[37] are examples. For example, in the SUNY model, the critical features of an information literate person include: identify and analyse types of information need; recognise difference in information provided by different sources; plan logical search strategy; use variety of print and nonprint information tools; use library organisation systems. Bruce includes characteristics such as controlling information, gaining novel insights, and using information wisely.[38] Considerable effort is evident in the literature in relation to detailing the specific abilities that are required. These are summarised here in three broad categories

Connecting with the world of information: questioning the information task or problem, brainstorming, identifying and defining what needs to be known, creating search terms, planning and developing search strategies, understanding the structure of the information base such as a catalogue, index, or database, implementing searching strategies to interrogate the database, operating the information technology appropriately, manipulating information objects such as books, files, fiche appropriately, compiling a hit list of located sources.

Interacting with the world of information: knowing the indicators of quality information, questioning the relevance of the located resources, challenging, confirming or disconfirming the validity of the information, evaluating the appropriateness of the sources, filtering out unsuitable information, dealing with the threat of information overload, analysing the information to identify important and needed components, interpreting the information against frames of reference, understanding the ideas, organising the salient ideas into some meaningful structure to create a synthesis, critiquing multiple viewpoints and opposing ideas, reflecting on and evaluating the information process and the information product; working with information confidently, ethically, and methodically, being self motivated and venturesome, being goal oriented.

Utilising the world of information: taking action, applying the information to construct an answer to the question, solving the gap in previous understanding, finding help, getting direction and being able to move on, creating an information product, making decisions and implementing solutions, developing new applications.

These attributes are centred on people relating to information, not people relating to life. The attainment of being information literate rests on measuring indicators of these attributes, demonstrated through people's ability to implement information skills processes. How do we know a person is able to do these skills? How do we identify these skills? What are the sources of evidence? The articulation, let alone measurement of these indicators is problematic despite the fifteen years of advocacy in Australia, and represents one of the key gaps in research to date. A variety of tools have been used to measure various dimensions of information literacy, either directly or indirectly. These include problem solving, use of hypotheticals, content analysis, examination scores, analysis of diaries, to name some, and by the use of measures designed to elucidate benefits, impacts, values of information literacy based instruction. Yet to date, the notion of what exactly is an information literate person, remains elusive.

In her review of the field, Bruce highlights some of the key limitations of the conceptions of information literacy as attributes. These include: they tend to be overgeneralised, being for all people at all times – a one size fits all notion; they do not take contextual factors into account, such as the workplace and everyday life, tending to be contextualised and situated in formal schooling; they are not constructed on people's experiences and derived from real people interacting in real world information environments, rather, they are conceptions of experts, seen through the voice of the protagonist and the advocate rather than the audience; they do not take into account individual's idiosyncratic ways of operating; the skills/process frameworks as vehicles for the development of information literacy tend to be linear in nature; and even more fundamentally, they 'have gained acceptance without having been subjected to any rigorous testing'.[39] Bruce is not discounting the contribution of an attributes focus to an emerging understanding of what information literacy is, nor that this approach should be dismissed (indeed, her early work has contributed to this[40]); rather, she is calling for widening our understanding by developing conceptualisations of information literacy from the real word experience of users of information in a variety of contexts, and using this as a basis for generalising about its characteristics. Her recent research[41] along these lines represents a significant contribution in our understanding. Through a phenomenographic study, Bruce sought to capture the *experiences* of information literacy of higher educators and identified seven qualitatively different ways – seven faces – of experiencing information literacy. The work is significant in that it shifted the focus from an assumed list of behaviours and attributes embedded in most definitions of information literacy, to a more conceptual understanding of people as active consumers and users of information, and how this understanding might shape information literacy initiatives, education and research.

In essence, the current discourse posits information literacy as a solution, in terms of information handling attributes to be developed and achieved. But this notion of solution begs the questions: what is the problem? What is the question that information literacy answers? It would seem to me that the essential literacy question is not so much: How can we develop people as information literate? This question focuses on what a person should be, expressed as information literate, rather than what a person might become and achieve, expressed in terms of the dimensions of everyday life. The essential question seems to be: How can we, as information professionals, bring people and information together in purposeful ways so that they can get on with their lives? These questions differ in terms of whose voice is listened to, what are the assumptions about people as information users, what is the starting point, what are the processes and approaches, and what are the intended outcomes. The latter question shifts the focus from information literacy conceptualised as a range of attributes and competencies determined by educators and protagonists, and creating the elusive information literate person, (a notion that has limited acceptance outside of educational and library arenas), to a holistic person centred and living centred conception of information literacy, where the real focus is on understanding the needs, barriers, empowerings, enablings, and benefits to the ordinary lives of people. At the heart of information literacy are people being able to effectively engage with their information world: to connect with, interact with and use information meaningfully and purposefully to get on with their lives. The outcome is not information literate persons per se, but people able to get the best out of, and contribute to living. The starting point thus is asking questions like: What qualities of life does information literacy enable? What are the everyday individual benefits? And, how does information literacy enable and empower people: choices, decisions, relationships, problem solving, understandings, overcome barriers, see the road ahead, move forward. These questions shift the focus of information literacy from a set of information handling attributes and behaviours to a person, life and living centred conception.

This is an important challenge, the take up of which I believe will contribute to a wider social valuing of information literacy, and one that may well be the focus of a committed national political agenda. It highlights the value and need for undertaking user centred research examining both conceptions of information literacy, and examining the kinds of helps people need in their information seeking and use to enable them to more effectively deal with their information environments, and to explore how their own lives have benefited. To this end, some examination of the wealth of existing research on the information seeking and information utilisation behaviour of many groups of people, through an *information literacy* lens, may uncover some key directions. Considerable insight will also be gained by focusing research on everyday people in everyday contexts, what it means to them to be information literate, and examining the barriers and factors that might help them become more effective users of information. Such findings will contribute to more focused information literacy programs for the community.

Theoretical underpinnings

The current information literacy discourse is firmly grounded in education – primary, secondary, university and TAFE – and librarianship. With few exceptions, (for example Owens' 1995 examination of information literacy in relation to the Hindmarsh Island Bridge episode[42]), it is explicated in relation to classroom teaching and learning processes and strategies, learning heuristics, and the cognitive development of learners. However, while links are clearly made to concepts such as independent learning, lifelong learning, learning how to learn, flexible learning, self directed learning, autonomous learning, transferable learning, and resource based learning, these links are tenuous and have been built on the assumption that developing students as information literate makes a positive difference to their learning, and to their lives beyond schooling. The key focus is not on developing a deeper understanding of information literacy per se, but on the importance of doing so, with a strong advocacy component of ensuring that they are an integral part of the teaching and learning process.

The second area of emphasis and application is libraries. Even so, this is contextualised in the literature as part of an educational process, and assumes various guises such as information literacy instruction, reader education, library education, bibliographic instruction and user education. More fundamentally, information literacy often appears to be conceptualised narrowly as library use, enabling users to effectively know their way around a specific library, make use of specific bibliographic tools, databases and systems, rather than on developing transferable skills related to interacting with information and understanding and applying information to a variety of personal contexts. Foster suggests that information literacy is 'an exercise in public relations' and 'an effort to deny the ancillary status of librarianship by inventing a social malady with which librarians as 'information professionals' are uniquely qualified to deal'.[43] Similarly, Miller observes: 'the word "literacy" carries with it the connotation of illiteracy, and the continuing implication that librarians are dealing with clients on a basic or even remedial level'.[44] These are undeserved remarks, but they highlight some key concerns of mine. Information literacy today is essentially a set of educational practices and applications focusing on skills, behaviours, attitudes and attributes of people related to information handling, and it is a clarion call by committed protagonists to improve literacy and learning outcomes. In addition, the information literacy discourse to date clearly elaborates a model of collaborative partnership in the development of people as information literate. This partnership is conceived in terms of expert/novice; teacher/learner, professional/needing, information rich/information poor. Specifically it is an unequal relationship between the information provider (librarian, teacher librarian) and/or educator (classroom teacher, academic) – the experts and the learner or novice. It is not an equal partnership built on mutuality; rather, in my view, it is an approach that assumes people have a problem with accessing and handling information – the person is the problem – and that information literacy, as a set of information competencies, is the solution. This is a deficiency model, and one I suspect that Miller and Foster are alluding to.

Overall there is no in depth explication of a theory or conceptual foundation of information literacy from any educational or librarianship framework. While some research has been undertaken in identifying the benefits of developing a range of information handling skills in terms of learning outcomes, and considerable discussion on its relationship to literacy and literacies, and lifelong and independent learning, there has been to date no in depth and cogent explication of theoretical underpinnings. It might be said that information literacy is in theoretical limbo. It is not grounded in a strong theory that characterises its uniqueness and gives it a raison d'être, that provides intellectual integratedness to its many voices and viewpoints, and that gives it intellectual integrity as an approach to not only information and educational practice, but as a fundamental of living productively, creatively and independently. And indeed, that provides a convincing and evidenced argument for the rhetoric. While it is tenuously linked to a learning and pedagogical framework, with even weaker and largely unelaborated links to lifelong learning, there is a significant need to take information literacy away from being perceived as a rhetoric about educational practice and commonsense practical applications and a clarion call by committed protagonists such as librarians in educational institutions to improve learning outcomes and to ensure their position in the educational process. Langford asks: 'Why have not the understandings and skills that inform information literacy become embedded into the classroom practices of teachers and educators?'[45] as well as formal teacher education programs? Its struggle for acceptance by the educational community is acknowledged, particularly in the teacher librarianship literature that has championed its value and practice. Langford asserts that what is missing in the information literacy rhetoric is 'the link that takes all this intellectual activity and reforms it into effective and considered change. ... Information literacy appears to be synonymous with libraries, and not with essential learning areas for success in an information based society .... a need to look hard at the big picture of education'.[46] While information literacy embraces notions of real world living, the broader social context, lifelong learning, and often speaks of the broader community as a learning community, these are essentially rhetorical statements and do not feature substantially in the discourse, yet give it a persona of wider legitimacy, at least to the protagonists. Information literacy and the everyday are by and large not explicated at all, nor is how information literacy might be developed at a community level. This concern is also central to Bruce's research,[47] and reiterates the issue raised earlier of the need to examine ideas and issues of information literacy in the broader social environment beyond formal education. This I see is one of the key challenges of the information literacy agenda for Australia.

Cavalier, in an address to the first information literacy conference in Australia in 1992, sounded a warning bell in this direction. He confessed: 'I am illiterate about information literacy. I have consulted with the leading figures in the Australian world of adult literacy. ... None of them were able to enlighten me on the term.' Focusing on the literacy component of the term, he concluded: 'it is doubtful that we gain anything by employing accustomed words in unaccustomed buckles to express a concept that is not itself novel'.[48]

There is thus considerable scope for educators, researchers and philosophers to articulate stronger theoretical roots of information literacy. I believe that there are a number of directions that a theoretical foundation of information literacy might take. These include: a stronger focus on a theory of information rather than a theory of literacy; a focus on understanding the voice/perspective of the everyday information user and non user; and a focus on people making sense and constructing meaning through information. This theoretical foundation would thus embrace a multidisciplinary and integrated study of human cognition, human information processing, knowledge creation, information needs, information seeking behaviour, and information and knowledge utilisation. These theoretical areas have long research traditions, have developed a range of investigative methodologies, and have amassed a considerable body of findings that illuminate people's information behaviours, and provide a rich foundation for understanding people in relation to notions of information literacy.

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A potentially illuminating, person centred theoretical framework has been developed by Brenda Dervin, and is known as sense making theory.[49] This theory currently exists as a pervasive theory in the study of information user behaviour, and is underpinning considerable research into people's interactions and engagements with information. According to Dervin, information is that which enables people to construct sense of their world during their lives and to use it to solve problems and to get on with their lives. The theory defines three fundamental dimensions: *Situation:* problematic situations which stop people from moving forward; *Gap defining and gap bridging:* information seeking strategies, and *Uses/helps:* how people perceive they can be facilitated, and indeed, the helps they need in relation to dimensions of their everyday lives. Information literacy, though this sense making lens, would not focus so much on attributes of an information person, but on understanding people's situations, their patterns of information seeking behaviour, and their conceptions of the helps that they need from information in order to move on in their lives, and the development of appropriate information interventions to enable people to reach their sought after outcomes.

This is not the only approach. Other theoretical approaches include: critical theory, relational approaches (as elaborated by Bruce [50]) and a range of interpretivist approaches that provide multiple perspectives for developing a cumulative, integrative, and informative approach to the field. What will establishing a theoretical foundation for information literacy enable us to do? It will enable us to more holistically understand the complexities of how people engage with and use information, to understand the needs of people that prompt their search for and use of information, to understand attitudes, behaviours and needs related to people's interactions with information. There already exists an extensive body of research findings that can illuminate this, based on studies of information user behaviour, cognitive information processing, knowledge construction and representation, and information utilisation. The analysis and interpretation of this research will enable us to think more laterally and creatively about information literacy interventions, and enable us as practitioners to consider information literacy in a wider range of contexts, other than the educational arena. Such an approach might encourage us to engage with other agencies that are providing information to various community groups. This kind of social collaboration may facilitate the development of specialised tailored information literacy programs for the community based on real needs, rather than the current one size fits all approach. Drug information agencies, business organisations taking on knowledge management, organisations dealing with a range of social concerns or social groups may benefit from the information literacy expertise of librarians and other information professionals, and such collaborations may facilitate the initiation of alternative conceptions of information literacy and alternative pathways to its development, particularly in the social arena.

I would like to illustrate this briefly through some of my own research[51-53] particularly research focusing on adolescents and heroin information. Recent media attention has highlighted the significant social dilemma: indeed, evidence suggests that adolescent deaths linked to consumption of illicit drugs is one of the highest in the world. It is easy to suggest that the solution to this problem is developing students as information literate, to ensure that they have the information skills to enable them to access the information they need to make appropriate lifestyle decisions. The critical question, it seems to me, is bigger than: How do I make these adolescents information literate? This question is based on a deficiency model of information handling. It assumes that adolescents have a major problem with accessing information, that the adolescents are the problem, and that information literacy, as a set of information handling skills, is the solution. My research showed that adolescents actually engage actively with information about drugs in order to build up an information base for decision making, to widen their understanding, to clarify misconceptions, to verify existing ideas, and to develop their own personal positions and viewpoints. They are active, constructive consumers of this information. The real question then becomes: Why does this drug problem continue, despite the extensive range of drug information programs and services tailored to adolescents? The reality is that we know little about the effective prevention of drug abuse among adolescents through our information processes. What happens in the minds of adolescents when they are provided with this plethora of drug information, not just in schools, but through the media and other services? How do they make use of this information, what influences how they interact with it, and what does this mean for the provision of information services?

From my research, adolescents make limited use of formal sources of information; they do not actively seek out such information in libraries (*It's not kewl to be seen borrowing a book on drugs from the library*); they seemingly reject vast amounts of authoritative information; they are highly selective in their intake of information; and they generally will not ask a librarian or a teacher librarian for such information (*I won't*

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ask – they'll think I'm a drugger). The problem is not so much one of adolescents being deficient in information handling skills, but in the nature, structure and packaging of the information that is made available to them. The provision, rather than the person, is the problem. Volumes of facts are not the answer, teaching classes on how libraries organise information is not the answer, testing students on how well they can search for information is not the answer. On the other hand, understanding the take up of information, especially in everyday life, understanding how information is used in personal/everyday decision making, understanding barriers to accessing and using information, understanding how information might be more appropriately consolidated, structured, and packaged, and understanding information use in different contexts and cultures, and developing responsive information services, all are part of the answer, and are in fact, critical to enabling people to engage effectively and meaningfully with their information worlds. One of the real challenges of information literacy is recognising that we, as information providers, may be part of the problem. Perhaps information literacy begins at home. If we shift our thinking from information literacy as a range of competencies determined by educators and librarians, to a more holistic person centred and living centred conception of information literacy, then the strategies we devise in response to enabling people to effectively engage with their information worlds will be considerably wide ranging and different. As information providers, we might, for example, seek to collaborate with industry, social and cultural groups in development of information strategies and information services; we might market our services, not in terms of what the library can do, but in terms real world benefits they provide, and not expressed in library speak; we might focus and promote information literacy development strategies in terms of everyday empowerment rather than as information handling skills; in essence think more broadly and creatively about information literacy interventions. For example, in the provision of drug information, adolescents acknowledge parents as significant sources of information. Information literacy strategies targeted to parent groups might be a more appropriate focus.

The future and its challenges

It is my view that information literacy is at a critical crossroad, and its agenda in Australia is an open one. There is the beginnings of a healthy debate that challenges some of the conventional ideas of information literacy and the emergence of contemporary and potentially illuminating approaches. This is to be encouraged. The development of multiple descriptions, positions, frameworks, perspectives, operationalisations, approaches, and even schools of thought will enrich our understanding and help generate a cumulative picture of what information literacy is. Intensive critique of the concept from different standpoints, without devaluing the gains already made in our understanding, will foster this debate. A personal philosophy of mine is we construct the road by walking on it. Integrating the information literacy discourse into a broader conceptual and theoretical framework centring on a more holistic study of information user behaviour will be particularly illuminating, if only in the first instance to enable us to critique and challenge some of our cherished assumptions about information literacy.

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TEACHING INFORMATION LITERACY SKILLS TO INDIGENOUS ADULTS

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Abstract *Teaching information literacy skills to indigenous adults is a challenge. At the Batchelor Institute of Indigenous Tertiary Education teaching information literacy skills has been in place for three years with a reasonable degree of success. This paper outlines the information literacy program and focuses on the 'unique' and successful aspects of its operation.*

Background

For the past six years I have worked with Aboriginal and Torres Strait Islander people in the library field. I was a Community Library Liaison Officer at the Northern Territory Library and since 1996 I have been the Remote Area Librarian at the Batchelor Institute.

The Batchelor Institute of Indigenous Tertiary Education is solely for Australian indigenous adults. It has about 2000 students from across Australia and offers both vocational education and training (VET) and higher education courses.

The main campus is at Batchelor, 100 kilometres south of Darwin and there is another campus in Alice Springs and annexes in Tennant Creek, Nhulunbuy, Katherine and Darwin. Lecturers are also based in remote communities across the Northern Territory. Many students who study at Batchelor are from remote Aboriginal communities.

The Institute offers mixed mode study which involves a 'blending of intensive workshops (conducted on campus, or at regional or community residential workshops), community based studies and research, supervised work experience and field studies'. It fosters a 'both ways' approach to cultural interaction and cross cultural learning, bringing together Aboriginal and Torres Strait Islander traditions of knowledge and western academic ideals.

My main role at Batchelor involves teaching students information literacy skills. In order to achieve this I facilitate the information literacy program. I formally developed the model for the information literacy program three years ago and it is constantly being adapted to meet student requirements. The program looks tightly structured but is in fact quite flexible and various sessions are altered constantly. This is one of the strengths of the program.

Success factors

The success factors and strengths of the information literacy program include

- flexibility – in a variety of aspects
- teaching information literacy skills in context
- building relationships with students
- effective communication skills
- positive attitudes
- building relationships with academic staff
- cooperative teaching
- adapting to students learning styles
- placing information literacy skills into course curriculum
- observing and implementing the *Aboriginal and Torres Strait Islander protocols*[1]

Flexibility

Flexibility is one of the main success factors of the program. Flexibility involves all aspects of the information literacy program such as session design, timing, negotiation with lecturers, teaching aspects and delivery sites.

Sessions are often repeated and/or there is a gradual development whereby the same group of students may do three sessions within a week in the library. The sessions are tailored to their courses by focusing on specific learning outcomes and incorporating subject or workshop topics into the sessions. The timing is also negotiated with the lecturer. The students may start with an introduction to the library, then progress to using the catalogue and then do an Internet session. However, I can adapt to student needs if the progression or content of sessions needs to be changed.

Flexibility is also inherent in the actual teaching aspect. For example, if I am teaching the Dewey Decimal system, depending on the students I usually pick a number such as 796 (sport). Then I either ask the students to name some sports which I then list the Dewey numbers for, or I ask them to go to the shelves, choose a sport book in 796 and then we discuss the specific sports topics and the Dewey numbers that are allocated to each book. The actual activity we do depends on the students and also whether they have used Dewey numbers before.

Flexibility in delivery sites is a unique aspect of the program. The Remote Area Librarian has a travel budget and conducts visits to communities for on site instruction. For example, in Angurugu (on Groote Eylandt) this year, a research project was undertaken by students. My role was to introduce the research process then commence it with them. During the sessions the information literacy skills of identifying information needs, identifying sources, locating and selecting information were explored. The students chose the topic for research that was directly related to their community. As the process was conducted in the community, the relevance and importance of information literacy skills was identified and the relationship to real life needs and contexts was identified and utilised.

Teaching information literacy skills in context

Using real life examples and contexts to link information literacy skills to students is important. To illustrate this I use true stories. This is an example

> *A couple of years ago, an Aboriginal man from Melville Island phoned me in the library. He said 'I have been out fishing and just caught a big turtle. On the flipper of the turtle is a tag. On the tag is the name of this place and I was wondering where this place is? Can you tell me?' I then found a map and faxed it to him to illustrate where the turtle was tagged. He was amazed to see that the turtle had been tagged south of Broome and had then swam all the way to the Tiwi Islands before being caught. Afterwards he boiled the turtle up for dinner.*

Telling stories is one method of relating information in a real life context and of linking libraries and information gathering, to community issues. It is one of the methods that I use when teaching information literacy skills. It is also a method for exposing libraries and explaining how they can be useful sources of information.

I believe that it is fundamentally essential to ensure that the information literacy skills that are taught within libraries, be linked to situations that exist outside of the library. So that information literacy skills are easily transferred and can be seen as thus. My role is to teach the steps of information literacy in the library but to link them to students' personal lives so that they can see the relevance, importance and advantage of having these skills. 'The inherent narrowness of the library view has the potential to divest information literacy of much of its power, which is derived from the real needs of students and relevant coursework. If our understanding of information literacy is confined to libraries it will be unfortunately destined for failure'.[2]

Information literacy skills taught in a library must be able to transfer to different contexts. From the library context to the classroom and/or community context.

To understand or at least be familiar with the community context, it is important to visit various communities. It is then easier to understand community issues and be able to relate to students. For example, one main issue that many remote Northern Territory Aboriginal communities have is that there are usually only small primary school libraries in them. For some students who attend the Institute, they have only ever had limited contact with tiny libraries in a primary school setting.

The limited number of libraries within Aboriginal communities is coupled with the fact that libraries have not been a traditional place to get information (within remote Aboriginal communities). Mick Dodson, during a keynote address referred to the difference between knowledge collection in western and indigenous cultures.

> In Western cultures... If you want to know a fact, to learn about the past, or make a plan for the future, chances are you'll go to a library and look up a book written by an expert. Now that is pretty different to the way it is done in indigenous cultures, where knowledge tends to be passed directly from person to person. It is a challenge to think about how to bring an oral tradition into what has been, literally a place of books.'[3]

Using an oral tradition to introduce libraries and teach students how to use libraries is valuable. One method is to tell stories such as the turtle story. Another method is to have group discussion.

Two years ago a group of students came to our library who had never been to a large library before. The first session we did explored the concept of a library and what they were for. We sat together as a group and discussed what a library was, and drew diagrams and words exploring the concept of a library on a sheet of paper. The outcome of the session was that the students linked the library to their own elders who were the keepers of information in their community. The session was useful in understanding the library by finding a metaphor to represent the library.

Using oral methods and placing information literacy skills into context is very important. Another success factor involves fostering relationships. Fostering and maintaining relationships with students and communicating effectively is also a critical success factor.

Building relationships with students

At the beginning of a session with students it is essential to establish a relationship with the students prior to instruction. I usually say where I am from, what I do, then I ask students where they are from, what they are studying and how is their workshop going etc. Establishing lines of communication and fostering a positive friendly relationship influences session outcomes totally. This is the same approach that I use with all library clients regardless of their background or culture.

Effective communication skills

Another critical factor is using effective communication skills. A general rule of thumb that I follow in order to communicate effectively in cross cultural situations is, do not concentrate on the cultural specifics of cross cultural communication skills unless you know exactly the specifics of the group you are communicating with. 'Aboriginal and Torres Strait Islander people are not a homogenous group. We consist of diverse peoples living in different places, and with different experiences, aspirations and histories.'[4]

For example, in some cultures it is rude to look a person in the eye. When you are not sure of specific cultural traits, generally acknowledge and respond to reactions and behaviour towards you. Be friendly, open and warm and not imposing or challenging. Be unhurried. Give the students plenty of time to respond. Also use standard English without jargon. Do not be condescending or patronising. If you are genuinely a friendly and fairly open person, communication will be more positive and successful.

Positive attitudes

The librarian's attitude is also totally influential on success. This is about personal attitudes, not teaching skills. 'Ensure accessibility by encouraging and fostering positive relationships between staff members and clients including peoples from all backgrounds'.[5] The key factor is 'encouraging and fostering *positive* relationships'. If you are not positive about what you are teaching, then do not teach it. Generally I have found that if you are enthusiastic and positive, it rubs off.

I personally also have a warped sense of humour which is an advantage because it helps students to relax and enjoy the sessions. Attitudes also influence the relationship librarians have with lecturing staff. Ensuring that these relationships are flourishing is a success factor.

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Building relationships with academic staff

Relationships with lecturers influence the sessions with students. They also influence how academic staff view the importance of, or value, information literacy skills, and whether they see the library staff as having a role to play. In order to further explain the concept of information literacy and its importance, I created a document for academic staff which gives an overview of information literacy and then how the library can teach these skills and incorporate them into coursework. I also offer sessions on teaching information literacy for staff members.

If academic staff are aware of and understand and support the importance of teaching information literacy then coupled with a healthy relationship, it paves the way for cooperative teaching.

Cooperative teaching

Cooperative teaching is another significant success factor. Arranging the timing of sessions, negotiating time for multiple sessions, session content and delivery are all negotiated. Linking sessions to workshop topics and themes is also included. For example, in one session the topic was 'sorting information'. The lecturer used some blocks of assorted colours and shapes to take students through an illustrated view of the variety of methods of sorting. I then followed up by using gathered information on a topic which were then sorted into a variety of ways. This type of team delivery and academic staff input into sessions is valuable.

Another example of teamwork with academic staff is the video *Gathering information* that was produced by the Institute last year. It is designed for new students as part of an introduction to study skills. The video outlines study skills and the library's role in gathering information and was jointly made by lecturing staff with input by myself.

For sessions to be a success, discussion, negotiation and team teaching with academic staff is essential. Another factor to consider is the notion of Aboriginal learning styles.

Adapting to students learning styles

Aboriginal learning styles have been identified by a variety of educators who generally make statements which include 'when you teach Aboriginal students, observe their particular learning styles such as: Aboriginal students prefer holistic views, learning through observation and imitation rather than verbal instruction, using imagery etc'.[6]

However, lecturers at the Batchelor Institute are wary of these identified learning styles. Learning styles effectively stereotype Aborigines and also do not take into account the social, political and historical aspects of society.

> Aboriginal learning styles theory represents a moment of elision, where complex identities and complex historical processes are simultaneously erased and naturalised… Aboriginal learning styles theory' and its offspring are founded on grossly oversimplified views of contemporary Aboriginality (and non Aboriginality), and particularly narrow conceptualizations of culture, which exclude understanding it within its broader social and political context.[7]

Do not use the texts on Aboriginal learning styles as a bible to teaching Aboriginal students. Recognise limitations of the identified learning styles and tailor teaching to the students as required.

Placing information literacy skills into course curriculum

The next success factor involves placing information literacy skills into course curricula. Examining and having input into the development of course documents is extremely useful. As a member of the Course Accreditation Subcommittee, I have access to course documents and can examine them to ensure that information literacy skills are incorporated. These skills are usually related to the course topics or can be topics/units on their own. Bruce[8] outlines the importance of incorporating information literacy skills into course curricula. If they are incorporated then lecturers are required to teach and assess these skills.

Other useful aspects of being involved in course development includes knowing the content of courses, what students are learning and how. This makes it easier to link library sessions to coursework. As long as librarians can link themselves to this process they will succeed in making information literacy sessions relevant to coursework.

Observing and implementing the *Aboriginal and Torres Strait Islander protocols*

The last significant factor that contributes to the success of the information literacy program is the use of the *Aboriginal and Torres Strait Islander protocols* compiled by Alex Byrne, Heather Moorcroft, Alana Garwood and Alan Barnes in 1995.[9] This document explains the protocols that libraries can use as a guide for both interacting with Aboriginal and Torres Strait people and handling materials with Aboriginal and Torres Strait Islander content.

At the Batchelor Institute Library we have observed the protocols and areas such as the library layout, employing Aboriginal staff and displaying artwork are incorporated in the library operations. Our library guides and brochures are designed to be easy to read and use as well.

The *Aboriginal and Torres Strait Islander protocols* are useful as a guide in our library where the majority of clients are Aboriginal and Torres Strait Islanders.

In conclusion, the main factors critical to the success of the information literacy program at the Batchelor Institute Library are

- total flexibility: in program design, session content, session delivery, teaching style, site delivery
- teaching in context
- building relationships with students
- using effective communication skills
- having a positive attitude (which shows)
- building and maintaining relationships with staff
- cooperative teaching
- adapting to students preferred learning styles
- observing and implementing the *Aboriginal and Torres Strait Islander protocols*

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THE ROLE OF THE LIBRARY IN AN INTEGRATED COMPUTER AND INFORMATION LITERACY PROGRAM AT SWINBURNE UNIVERSITY OF TECHNOLOGY

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Abstract *This paper discusses the role of the library and the library staff in the information and computer literacy program at the Lilydale campus of Swinburne University of Technology. It outlines the background to our involvement in the program in the context of the educational environment at Lilydale where there is a strong emphasis on flexible delivery and alternative approaches to teaching and learning. The organisation, design and development of the curriculum is described and an evaluation of our student assessment procedures is made. Some of the questions which were asked on the assignment and exam undertaken by the students are compared for effectiveness. The program is evaluated and possible future directions are considered. The impact on library staff and work patterns is discussed.*

Introduction

At the Lilydale Campus of Swinburne University of Technology library staff are responsible for the design, delivery and assessment of twenty per cent of a compulsory first year subject. We design and develop curriculum, compose the relevant section of the learning guide, deliver lectures, set and assess assignments and examination questions. Our module comprises one of five in a subject called *Information methods* and, although we liaise with the course coordinator, we have control over the content of our component. We believe we have achieved a high degree of integration into the mainstream curriculum and that students and staff readily accept library staff as part of the teaching and learning process.

Before looking at our information literacy program in detail some background information helps to set the scene.

Distinguishing features of Swinburne's Lilydale campus

Our campus has some features that distinguish it from other educational institutions and to some extent from other campuses of Swinburne. These are

1 a multimodal and flexible approach to course delivery
2 heavy reliance on electronic delivery of research materials
3 a strong sense of community among students and staff
4 close ties with the local area.

The first two of these points in particular have major impact on the library, on the resources we collect, the skills we need and how we do our job.

Background

Lilydale campus opened in 1997 to accommodate students and staff from the much larger Mooroolbark campus a few kilometres away. It had been planned to move students from one campus to the other a year at a time but, for a number of reasons, a decision was made to close Mooroolbark and move the whole operation to Lilydale. So 1997 began with 1200 students instead of the expected 400. There was only one building and because it was envisaged that students would work offcampus to a large extent, only a very small library was built. It contained no discussion rooms, no silent study areas, no carrels, no reference office nor office for the Library Manager. Most of the floor space was taken up by computers, and four large tables with chairs set very close together. This was not an atmosphere conducive to quiet study. Over the three years we have been at Lilydale the physical situation has improved a little but, as students numbers have grown, we are very crowded and the library is often extremely noisy.

This situation exists in what is a prize winning building and seems to be the result of a mistaken idea of how people use virtual libraries. The students *are* on campus and they want to use computer facilities between lectures and tutorials. They can access all the resources from the computer laboratories and most of them at home but many students prefer to work in the library where help from the staff is at hand. The environment in what is theoretically a virtual library is very far from the serene place that this term may conjure up. The library is thronged with people most of the time.

Course delivery in an electronic environment

Lilydale campus is designed to be a virtual learning community where teaching and course delivery is flexible and where multimodal technologies are central to the educational process. Quite a large number of students do not attend lectures either because they cannot, owing to work or family responsibilities, or because they know there are alternatives.

All lectures are videotaped and can be viewed via *Video-on-demand* from the PCs in the library. After a couple of weeks they are transferred to a conventional video and held at Counter Reserve for the rest of semester. Most lecturers use PowerPoint slides in their presentations and these are accessible through the shared G drive for students and staff. Also on the G drive are learning guides, assignments, various notes and other course related material. Some lecturers prefer to attach course materials to the home page on the web and some stay with the Counter Reserve approach.

Consequently, students need to adapt to finding resources in a variety of places and it can be rather confusing at first. Many of the students enrolled at Lilydale did not choose this campus because they particularly wanted to study in a high technology environment but because Lilydale was the only feasible option for them for geographical reasons. Some of these students are overwhelmed by the steep learning curve facing them when they begin their course, and dismayed to discover that, until they develop sufficient computer skills, they cannot begin to study their subject of choice effectively.

Our students have access to the resources held at the four other Swinburne campuses but as we have only a small collection of print materials at Lilydale, we are heavily reliant on electronic resources. Computer literacy skills are essential to survive in an environment where students are expected to work through computer based learning packages, to email assignments to lecturers, and to research essays using references sources that are largely in electronic format. The library also communicates to students by electronic means, for example holds and overdue notices are sent by email.

Program organisation

At the beginning of the year incoming students sit a placement test to assess their level of computer literacy. Those with low levels of computer literacy skills have to do both modules A and B of the *Information methods* subject. This means they are studying this subject for the whole year, across two semesters of twelve weeks each. In module A, in addition to the information literacy component, they learn basic skills and software applications such as Excel, Access and PowerPoint. Their major assignment, set by the subject coordinator, obliges them to demonstrate high levels of skills in these areas as well as in using library resources.

Students judged to have good levels of computer skills are exempted from most of the module A curriculum and can complete the course in one semester instead of two. However they still have to do the library assignments for modules A and B. The module B component builds on module A while developing more academic and sophisticated information literacy skills.

The students need to develop survival skills very quickly. In a twelve week semester, particularly one where a high proportion of the work involves using computers they have to hit the ground running. To help make this possible a series of workshops is held in the labs and the library during Orientation Week. We set up the logins and passwords the students need to access the computer network and introduce them to the library and learning environment at Swinburne. Orientation Week is becoming increasingly important for academic rather than social reasons.

Information methods curriculum

To see how the library component of the course fits into the overall scheme it is helpful to look at what is covered in the subject as a whole. Topics include

1 Information, communications and computer literacy
2 Computer operating systems and applications
3 Information technology and the library

4 Computer assisted and managed learning
5 Networking, electronic mail and browsers
6 Data communication
7 Information presentation: word processing; constructing web pages; presentation software; spreadsheets
8 Database organisation
9 Multimedia and graphics

Unit 3: Information technology and the library
Library staff are responsible for writing the curriculum and the learning guide[2] for this section of the course as well as preparing and presenting demonstrations of the electronic sources which students are required to master. Students spend two weeks on this unit which includes information finding skills and higher level, more abstract, information literacy education. We follow the same pattern of delivery as the rest of the course. All materials except the prescribed textbook (*Teaching information literacy skills* by Patricia Iannuzzi[3]) are available electronically to students so they do not need to miss out on any information if they miss our lectures. To complete the required work for the library component of *Information methods* they have to move between several different sources on the web, the library catalogue and sources on the G drive.

Course design
Library staff deliver lectures and demonstrations in the normal *Information methods* lecture time in weeks 2 and 3. Students are also expected to work through a self paced online information skills tutorial[4] that was prepared originally in late 1997 but is subject to updating whenever necessary.

The library component of module A aims to give students a skill level sufficient to get them through their first essays and to come to grips with using the Dynix catalogue. These students do module B in second semester which covers the other three units of the online tutorial. Even though the students exempted from module A have a reasonable level of computer literacy they find the library work totally new to them. Few of them have encountered Boolean operators before or considered the problem of searching the contents of journals.

Because of the large numbers involved we have been using a lecture theatre which means hands on is not possible in these sessions. We design the assignment in such a way that students are forced to use the computers to complete it, for example they are asked to attach original print outs of search results to the assignment. As students are from all disciplines (Social Science, Applied Science and Business) the examples that we use in our demonstrations are drawn from all subject areas. We try to show that the skills developed in one area can be transferred to other situations and are not confined to the specific search being carried out at the time.

The objectives of our lectures are to assist students gain skills in
- using the library catalogue
- determining which resources are appropriate for different purposes
- selecting the most suitable electronic database for a particular information need
- formulating an effective search strategy
- searching five specified electronic databases
- searching the World Wide Web for course related material.

When we were revising the course for 1999 we wanted to make use of the online information literacy tutorial which library staff from three campuses had spent a good deal of time constructing. We set out to design a unit, which directed the students to the tutorial at various points. We also had web based guides to each of the databases we were demonstrating. This meant students were required to juggle several sources of information and it was becoming quite complex. Our reference librarian, Susan Roberts and myself completed a three day workshop in instructional design and developing self paced learning materials which helped us to organise the material in the best way possible, write clear, unambiguous instructions and use the active rather than the passive voice. We also learnt about catering for different learning styles and preferences, something, which is easy to overlook when web based delivery is the norm. We have tried to vary the activities as much as possible. In the first year of the course, 1997, the university provided an instructional designer to work with us which was helpful, but as it appears that extensive revision each year is going to be the norm, it is better for us to develop some of these skills ourselves.

The units of the online tutorial are

- Library catalogue
- Constructing search strategies
- Searching the Internet
- Searching for periodical articles in print and electronic form.

In the lecture we demonstrate how to use the tutorial, the library catalogue and several of the most widely used electronic databases: two Internet databases ***EBSCOhost*** and ***InfoTrac***; three CDRom databases, *PsycLIT*, *Abix* and *The Age*; and *Austrom* which is accessible on both the Internet and the CDRom network.

We also reinforce some of the most important material from the online tutorial by showing a number of PowerPoint presentations. As students are used to their lecturers using PowerPoint on a regular basis, this helps them to focus and concentrate. The presentations are stored on the G drive and are accessible to students at any time.

Student assessment

All students do the module A assignment on using the library catalogue in the first couple of weeks of semester. Those exempted from the rest of module A then go on to do the more demanding module B assignment.

The Module B assignment is composed of five sections with three questions in each
Section 1 is on the library catalogue (more advanced questions than in module A).
Section 2 is on constructing a search strategy and covers things such as boolean operators, using a thesaurus, an index, using wildcards and truncation, and analysing an essay question.
Section 3 requires students to use the CDRom databases, *Abix*, *PsycLIT* and *The Age* newspaper.
Section 4 involves searching the Internet databases *Ebsco*, *InfoTrac* and *Austrom*
Section 5 covers searching the World Wide Web and CoolCat. CoolCat provides an avenue to further resources to supplement our small print collection so we make sure that students know how to use it effectively.

As well as the assignment we also set an information literacy component in the final exam which accounts for twenty marks. This is completed under normal exam conditions where students do not have access to computers so the type of assessment has to be different. We test such things as which database to select for various subject areas, how to use logical operators, truncation symbols and wildcards, and how to devise a search strategy. Questions vary in their format: some are multiple choice, some are true and false and some involve writing a short explanatory paragraph.

Constructing the assignment and examination questions has been a very exacting task. It is not easy to formulate a question which tests what you want it to, is clear and unambiguous, and which, in the case of the exam questions, can be done without access to a computer. Often the questions that we expect the students to do well on are not as easy as we thought they would be. In the assignment it is difficult to prevent students from copying answers from each other if there is only one right answer. But if we design questions that require the students to produce unique answers we have to check them all on the system which creates a lot of work for us.

Our assignment on *Abix* in first semester this year was difficult for many students

> Use *Abix* to find an article written by Kristina Sullivan.
> Write down the title of the article which has *Microsoft Corporation* as one of its subject headings and the date of the issue of *PCWeek Australia* that it was published in.
> Use the catalogue to find out which Swinburne campuses have copies of this issue.

Even though we had explained at length that *Abix* is only an index and that they had to check the catalogue to see whether the article was held at Swinburne, many students could not apply this information and continued searching in *Abix* for local holdings. Some students become so accustomed to having journal articles delivered to the desktop that they have trouble accepting that a database can be only an index. Or they regard it as being of no value.

Despite receiving feedback from us on the *Abix* question, students were still having difficulty with this concept when they did the exam a couple of months later. The following question had a failure rate of over 90 per cent. One student insisted to us after the exam that two of the choices were identical.

> To find out whether a particular journal article was held at Swinburne you would search the library catalogue by
>
> (a) Selecting PERIODICALS - TITLES and typing the title of the journal
> (b) Selecting PERIODICALS - KEYWORDS and typing the author of the article
> *(c) Selecting PERIODICALS - KEYWORDS and typing the title of the article*
> (d) Selecting PERIODICALS - TITLES and typing the title of the article

Another question which caused problems in the assignment was on using the truncation symbol to increase the number of records retrieved when searching an electronic database. Students truncated every word in the search statement instead of just the keywords and some students truncated the words right back to the first few letters and consequently retrieved thousands of records. We had not anticipated responses of this nature and we learnt an important lesson about constructing questions.

The exam question on truncation was much more successful

> In approximately 50 words explain and demonstrate how you would use a truncation symbol to maximise the number of hits when searching for information on computer crime.

Generally, these open ended questions were better discriminators between good and poor students. The questions on boolean operators were well answered in the assignment and the exam. The assignment question was

> Use three diagrams and three examples to illustrate how Boolean operators are used in searching an electronic database.

The exam question was

> Explain the effect of each of the three boolean operators in a search statement. Give an example of each.

And finally, one exam question which virtually everyone answered correctly was

> To locate a book or journal in another Victorian university or college library you would search
>
> (a) Hot Dog
> (b) Cool Cat
> (c) Web Wombat
> (d) Gopher

What is the reason for the poor performance of so many students on concepts which we believed had been fully explained and demonstrated? Two or three possible explanations spring to mind. One is that while our regular library users develop high skill levels through constant reinforcement, even the nonlibrary users have to sit the exam and they tend to bring down the average mark. In addition, some of the students with low entry level skills find it difficult to make the necessary distinctions between the vast array of electronic databases all with their different software and access passwords. On the other hand, some students who enter the course with good computer skills are sophisticated Internet users and try to get by without using the library based databases. They are therefore unable to answer the questions on the exam.

The reluctance of many students to use index only databases means that they get little practice using *Abix* and even less searching for print copies of journals. Because obtaining a print copy of an article often involves a two or three day delay while the article is brought from another campus, many students are not interested in pursuing this form of hard copy.

The poor response to the *Abix* question suggests that print journals are only valued by students if they are held on the local campus. This is supported by the fact that usage of locally held journals remains very high but requests for inter campus periodicals has declined markedly over the last year or so. Now that we have been at Lilydale for nearly three years, most of our students have never studied at the old Mooroolbark campus. They have all been brought up on electronic delivery. We have seen huge increases in the usage of the databases which we cover in our course. In 1997 there were 15,032 searches carried out on the *EBSCOhost* databases. In 1998 this number had jumped to 114,609. From January to September 1999 the number of searches was 190,840. A similar pattern is evident with the *InfoTrac* databases. On the whole, the questions on the exam and the assignment that were answered best were those that related to electronic searching.

Because *Information methods* is a compulsory subject, many students were taking it who may not have chosen to do so, and they did not do well on other sections of the paper either. Finally, we do not get the opportunity to revise the work with the students close to the exam period. We have relied on them using the databases throughout the semester to reinforce their skills. Although many students do become very competent searchers, others try to avoid electronic sources of information. This is still possible in one or two courses where the academic staff also have tended to avoid them.

We have tried to address some of these issues in our teaching in second semester and after the exam we will see how successful we have been. The average mark obtained on the assignment was much higher than on the exam suggesting that a high degree of collaboration took place when students worked on the assignment. Improving our student assessment procedures is our biggest challenge.

Impact of the program on the library

We believe we have made a significant impact on curriculum development at Lilydale but what impact has our involvement had on us?

A great deal of time is spent in the development, delivery and assessment of these assignments and exams as well as in writing up the learning guide and preparing the lectures. The subject coordinator is very supportive and is willing to provide funding to allow us to work extra hours when necessary. So far we have only been forced to do this when correcting the exam papers as these have to be done very quickly. If we are going to be considered part of the academic staff we should try to absorb these extra duties as much as possible. If we do it well it should mean that students are capable of doing their own research without mediation by library staff. We now have many first year students with levels of information literacy skills that would have been exceptional in a postgraduate student a few years ago.

Our involvement in the mainstream curriculum has raised the profile of the library staff in a way that traditional user education sessions never did. Increasingly students regard the library staff as being on the same footing as academic staff in the teaching and learning process. Most new students arrive at university without any preconceived ideas about the library and accept the instructional role of library staff quite readily.

Working in a virtual library with extended hours of access often means that library staff are approached by students needing help with computer based packages on subjects such as accounting or multimedia. We do not want to encroach on teachers' territories but frequently students find they cannot continue with their work until their problem has been addressed. The library staff are still working three or four hours after the academic staff have gone home and on weekends. The student can be held up for several days if the librarians are not able to help them. In these circumstances is it OK for library staff to, for example, explain accounting concepts to students?

A related issue is the students' dependence on library staff for technical support. To what extent should a librarian be expected to fix technological problems that arise with the computers? Where do the boundaries lie between what we do and what the Information Technology section does? At times it is easy to feel that you are presiding over a computer laboratory rather than working as a reference librarian but once again the library staff are frequently the only staff left on campus when the problem occurs.

My answer to both these issues has been to forget about having a philosophy on what I should or should not do, but to do as much as I can to help the student rather than tell them they will have to wait until they can see their tutor or a technician. I do not advise them about curriculum related matters unless I am sure of my facts but with computer related questions I feel more at liberty to try various solutions. I try to take advantage of any training that comes my way to increase skills in this area but I have stopped worrying about demarcation of duties. Over the years I have broadened my definition of what constitutes a library information service and basically will do whatever is needed to facilitate the student to advance in their work

'THAT couldn't possibly happen!'

Some academic staff have developed computer based programs which they believe to be fully self contained and incapable of running into difficulty. They do not imagine that library staff will ever be asked to solve problems or be involved at all. It can be difficult to convince them that problems are arising. Sometimes it is simply a case of the teacher not having registered the student to use the program and there is no way we can get around that. Whenever possible we ask the academic staff member to train us in the use of the program or at least in some rudimentary trouble shooting.

Integration of library literacy into other subjects

This paper has focused on our involvement with a first year general subject but we also hold specialist classes for many of our other subjects such as tourism, tax accounting and psychology in tutorial times or as sign on voluntary sessions. These are usually hands on sessions and are often for students in higher years.

Many lecturers include library research skills in their courses with mixed success. Those that confer with the library usually come up with something very useful but those who devise their own research project can run into trouble. One lecturer distributed an exercise that required the students to compare traditional print sources and electronic sources of information. However, print sources for her subject were very scarce in our library. We do not have the necessary print indexes for example. Problems can also arise because lecturers often do not want to upgrade learning guides each year and the library component of their course may not reflect the current situation in the library.

As well as this we often do a 15 to 20 minute demonstration in a lecture to help students with a particular assignment or to show a new database in their subject area. Usually we are asked to do this but occasionally we initiate the session if we think it is called for.

Program evaluation and future directions

Assessing the students' work gives us an opportunity to identify weaknesses in our program. It is rather a shock to find high failure rates on a topic that we believed we had covered adequately. Over the three years we have been delivering the program it has changed quite a lot, from being very academic and abstract the first year, to very practical the second year, and a balance between the two in the third.

The program will always be subject to revision and improvement. I would like to make it less complex and reduce the need for students to juggle so many sources at once. At present this is largely out of our hands as we are constrained by the technology. We also come up against the problem of constant changes, for instance we having been living in expectation of the arrival of our web based catalogue for over two years. It will be up and running from the beginning of next semester which means much of our program, but especially the online tutorial will have to be rewritten. The three information staff are all on academic year tenure and we leave in early December not knowing how much of what we have prepared will still be useable in March.

In 2000 we will move to electronic assessment of the assignment. To date we have put the assignment on the G drive so that the students can download it themselves and hand in a print copy when they have completed it. Next year they will submit the assignment electronically which may reduce the incidence of students copying from each other. However, the limitations of the technology will increase the need for very careful structuring of the questions. We also intend to increase the amount of hands on tuition by booking every available computer on the campus and running six one hour sessions over one day, probably in the first week of semester.

So how did we do it?

I have worked at other institutions where it has been difficult to persuade academic staff to allocate time to information literacy programs. This is not the case at Swinburne at Lilydale. We can always be sure of a positive response if we suggest a user education session to staff. This leads back to the strong support for the library from most academics, one of the four points made at the beginning of this paper. It is also a recognition that in a high technology environment the students and staff both need the intervention of library staff to function effectively. It is glaringly obvious that an incoming student, even if they are computer literate, will need considerable assistance in making the best use of the resources at Lilydale.

Most of our academic staff have positive attitudes towards information technology and want to use it to the best advantage in their courses. They are well aware that their students need help in learning how to use it effectively. It is apparent that only an information specialist such as a librarian is in a position to provide tuition on abstract concepts and practical skills across a wide range of subject areas which involve a vast array of ever changing technologies.

Conclusion

The level of integration into the curriculum that we have achieved represents a shift in the status of the library from a support unit to a central position in the academic life of the university. The role of the librarian is undergoing constant development and a greater depth and breadth of skills than ever before is required. In pushing for the integration of information literacy into the curriculum we need to be aware that we are taking on a tertiary teaching role that may be a daunting prospect for some library staff. Our course is subject to evaluation by students and we have to be ready to accept and respond to their feedback.

Teaching involves a great deal of preparation and correction time and this will inevitably impact on other duties. The role as teacher brings you into closer contact with students and the nature of your interactions changes, especially when they know you are setting their exams and grading their work. However, the opportunity to follow the progress of students over the longer term is very rewarding. We feel confident that most of them eventually reach high levels of information literacy and technology skills which stand them in good stead for the duration of their course and beyond.

At the Lilydale campus of Swinburne we have arrived at a position where integration of library related information literacy into the curriculum is quite formalised and structured. This has given us the opportunity to enhance the image of the library and the profession among students and staff, and to highlight the significance of the skills we have to offer. We are making the most of it.

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WHY WON'T THEY USE OUR LIBRARY? IMPLICATIONS OF A PILOT STUDY INVESTIGATING THE INFORMATION SEEKING PREFERENCES OF SECONDARY SCHOOL TEACHERS

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Abstract *This paper is an examination of issues effecting collaboration between teachers and teacher librarians that have emerged during the course of doctoral research being conducted into the information seeking preferences of secondary school teachers.*

Introduction

Is it possible for a successful graduate to spend six years of her/his life as a student in a secondary school and enter the library only once, in Year 7? Yes, according to conversations with ex students at the school at which I am now employed as Technology Librarian. Is a high proportion of student nonusers the reflection of a high proportion of nonusers amongst the teaching staff? Observations over the past five years would appear to support this view. Such a degree of negativity towards the perceived value of the library must surely constitute a failure on the part of the school library and its library staff.

The literature has tended to focus upon the users, rather than the nonusers of school library services, using such phrases as '…when the teacher brings students to the library for research assignments…', almost as if this manifestation is an automatic fait accompli. Yet how frequently is the cry heard from teacher librarians: 'We have such wonderful resources and a brand new library. Why are they not utilised more?' 'Why do teachers not lead by example and consult with us before setting an assignment?' 'Where does *that* teacher think that she will find the resources needed to successfully complete *this* particular research assignment?'

The questions

Is active collaboration (either structured or informal) between teachers and teacher librarians critical to the success of the student research process, or are teacher librarians merely inflating their own importance and desperately seeking to justify their continued existence? Do teacher librarians really have a mandate on information skilling, much as we are taught in library school? With an increasing number of research resources available online or via the Internet, independent of the traditional library environment, is a high degree of end user technology competency a necessary prerequisite to excellence in information literacy?

There is little doubt amongst proactive practitioners of school librarianship that active, ongoing collaboration between teachers and teacher librarians delivers the most positive outcomes regarding information literacy standards, or skills for lifelong learning. Furthermore, research such as that conducted by Kuhlthau[1] and Todd[2] indicates that positive, quantifiable improvements in academic performance are also deliverable. Unfortunately, this epiphany has yet to be experienced by the vast majority of teachers and principals. It is apparent both from a review of the literature, from personal experience and informal discussions with fellow teacher librarians, that collaboration is *not* the automatic response of the majority of teachers who are faced with setting a research assignment for their students.

Why is this so, does this pose a problem and what can we teacher librarians do to alleviate the situation?

When secondary school teachers commence setting research assignments for their students, it is generally anticipated that they are pursuing pedagogical outcomes far beyond a mere regurgitation of facts. In schools, increasing emphasis is being placed on the acquisition of both information literacy skills and

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technology competencies. Expenditure by both public and private educational sectors on the technology infrastructure, training and support necessary to facilitate these outcomes, is increasing. Simultaneously, advances in digital technology have created new challenges for educators attempting to address the information literacy needs of school students. One of the most daunting challenges is that posed by the information explosion, that massive increase in the number and variety of information resources available to students and teachers for research (and other less academic) purposes, resulting from advances in digital technology, such as the Internet.

While a significant number of studies have examined the information seeking behaviour of students, fewer have concentrated on that of secondary school teachers who are responsible for setting the research assignments. Given the current emphasis on the pursuit of high standards of information literacy, just how well equipped are our secondary school teachers as role models for best practice in the research process? What factors impel (or impede) effective collaboration between teachers and teacher librarians? How is the role of the teacher librarian regarded by teachers, and how might this perception impact on the role of the teacher librarian in the information seeking process?

The information literate teacher: the exception or the rule?
A review of the literature has revealed insights into the efficacy of the processes involved in the acquisition of those skills needed to demonstrate competencies in both information and computer literacies. Information literacy has been defined as the ability to access, evaluate and use information from a variety of resources.[3] The ALA's definition of information literacy states that 'To be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information….information literate people are those who have learned how to learn.'[4]

Within the educational context, Bruce[5] identifies an information literate person as one who engages in independent, self directed learning, implements information processes, uses a variety of information technologies and systems and has a sound knowledge of the world of information. It is imperative that this knowledge can be applied to the classroom research experience, with teachers equipped to best assist their students to become more effective researchers.

The roles of the classroom teachers and their students remain central to, but do not necessarily operate in isolation from other information or subject specialist intermediaries. Doyle[6] states that since teachers are the most critical key to student attainment of information literacy, it is vital that they become information literate themselves, comfortable with the variety of resources as well as the process of accessing, evaluating and using them. In addition, McGregor's study[7] into the purposes and objectives of researching and writing a school assignment demonstrates the existence of a relationship between the complexity of student thinking and the process or product orientation of these students, implying that teachers have fully grasped certain intrinsic pedagogical goals beyond the mere acquisition of marks.

On the other hand, how have students and teachers coped with the demands of computer technology, now so essential a tool for research and productivity? Studies involving students have shown that perceived comfort or anxiety about computers predicted their confidence levels about computing.[8] Furthermore, results indicate that students' desirability of learning computer skills can be predicted by their self recognition of the usefulness of computers and their perception of advanced levels of computer technologies.

It would be comforting to think that the 'Sages on the stage' are supplying positive role models for students, in the above areas. Unfortunately, it appears that many teachers may be lagging behind in the skills and competencies deemed to be essential in this digital age. Recent studies suggest that teachers frequently appear to be unable to provide instruction or appropriate role models in applying computers in education. It is of further concern that research currently being conducted by the University of California Berkeley Digital Library project has identified a critical relationship between the nature of the information seeker, their purposes, the topical context of the information need and their use of specific practices, technologies, medium, intermediaries and content.

These negative indications have been partially reinforced by research undertaken by O'Connell and Henri, who have investigated ways in which teachers' personal experiences of the process of seeking information predicate their teaching of the information search process to students. Over half (55.6 per cent) of their respondents preferred to stay with the sources with which they were comfortable, and would generally confine their search to the same types of information sources, reflecting a so called 'naïve approach to sequence'.[9]

How might the information seeking preferences of teachers impact on their expectation of similar behaviour in their students? McGregor[10] documents that the teacher librarian in one of her studies stated that 'when she offered the kind of introductory lessons expected by the teachers, the students "politely waited" for her to finish so they could go about the task the way they had always done before'.

Recent theories imply that a teacher's expectations of students' information seeking behaviour during the research process may well be influenced by their own. Hermann[11] suggests that there exists a link between, eg. the thinking preferences of university teachers and those of their successful (ie graduating) students. Furthermore, Hermann's *Whole brain model* theory postulates a strong link between brain dominance and thinking preferences, which he claims establish an individual's interests, leading to the development of competencies, influence on career choices and ultimately the work that people do. Other factors that have been postulated as motivators include thinking/learning styles and Myers-Briggs personality types.

The literature therefore indicates that there is a multitude of variables that influence the ways in which an individual, such as a teacher, will approach the information seeking challenge. It is not surprising that many teachers approach the research task from a product rather than a process orientation, with disastrous effects on the likely outcomes of any information literacy collaboration that might be proposed by the teacher librarian.

Effective collaboration: a rarity or commonplace?

Within the secondary school environment, the roles played in the research process by the school library and by the teacher librarian have undergone redefinition in recent years. Change has been most beneficial in those schools in which a process centred approach to information problem solving has been perceived to be achieving positive outcomes. Skilling for information literacy is now more frequently recognised as an area in which the teacher librarian can make an invaluable contribution to the success of the research process, eg in implementing a structured approach such as the 'Big Six'[12] approach to information skilling.

Todd's study,[13] which targeted junior science students, has further reinforced the view that an integrated information skills program has a positive effect on students' mastery of curriculum content, their ability to use a range of information skills, carry out research tasks and perform problem solving.

However, collaborative planning between teachers and teacher librarians is not (unfortunately) an automatic feature of the research process. When Kuhlthau[14] expounded her theory of a *process approach* to information problem solving, she noted that although 'far too many people are information poor in an information rich environment', the school librarian was *not* the person to whom school users most commonly turned for a discussion of their information needs. These findings were shared by the research outcomes of McGregor,[15] who postulated that student learning might, in fact, even increase if teachers and librarians were to mediate more effectively during the library research experience.

One of the most significant features influencing the likelihood of collaboration is the attitude of the teacher towards the librarian and, indeed, to the library itself. Since there are a multitude of ways in which teachers may prefer to seek out information, apart from utilising the resources of the school library, it is not surprising that there are many members of the teaching staff who are unfamiliar faces. How do those teachers who could be deemed to be library users, prefer to operate within the library environment?
Kuhlthau[16] reported that the teaming of teachers with librarians was giving rise to problems resulting from librarians becoming involved in areas formerly considered 'the teachers' domain'. For example, some librarians were reporting that they were being left alone to complete instruction and guidance. At what point, in the information seeking perspective of a teacher, does the *helpful librarian* become the '*interfering*

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busybody? At what point, from the perspective of a teacher librarian yearning for genuine collaboration, does a teacher's *independent research process* metamorphose into *conscious avoidance, intellectual arrogance, recalcitrance* or plain, uncomplicated *laziness*? Dark thoughts, indeed!

The importance of genuine collaboration during the information skilling process cannot be stressed too highly, according to Kuhlthau, who states that 'instruction that promotes collaboration in the process of information seeking and use builds skills and understandings that transfer to other situations of information needed'.[17]

How might teachers view the role of the librarian and the library?

Mutual professional respect between teacher and teacher librarian is the keystone of successful collaboration. Many teachers appear to be unaware that their librarian is (hopefully) a qualified and experienced classroom teacher, employed (and perhaps paid more) under the same type of award. The joint ASLA/ALIA document *Learning for the future*[18] recognises 'the unique, integrated nature of the role', stating that the teacher librarian must be 'a person who holds recognised teaching qualifications and qualifications in librarianship'. The teaching/skills mentoring role of the school librarian in the collaborative process will lack credibility if this individual does not possess qualifications and experience in both teaching and librarianship. Effective collaboration will be further enhanced by the provision of a high quality and personalised level of service to the teachers and students concerned, with a view to building their confidence in the ability of the information literacy processes to achieve outcomes that are mutually recognised as desirable. The success of this scenario depends, of course, on adequate levels of staffing.

It is disheartening to note that the dark storm clouds of economic rationalism, particularly at the state government level, are continually threatening or actively eroding professional standards in this area.

Similarly, for all too many teachers (and students), the library is still just a repository for books. The fact that an increasing number of information services are being delivered or facilitated via computer technology, is still an alien concept to certain of our nonuser clients. Alarmingly, not all of these would be deemed as the older generation of teachers or students, begging the question of what exactly is being provided in the way of technology literacy, let alone information literacy skills, in our teacher training institutions and schools.

Possible causes of students' reluctance to engage in the research process were partially attributed to negative experiences with librarians, libraries and technology, or the ability to find adequate research time, according to research conducted by Burdick.[19] 'School librarians were not seen as helpful and the resources centre not user friendly.' If students lack the motivation or desire to locate, evaluate and use information in a meaningful and effective way, to the extent that they can be defined as 'information aliterate', might the attitude of certain of their teachers have played some part in the formulation of such perceptions?

O'Connell and Henri's Bethlehem College study[20] showed that while teachers are likely to discuss a research topic with others as a way of developing focus and pursuing their research, they are less likely to explore a topic with someone they believe has some prior knowledge of the focus for research. They are 'even less interested in seeking mediation from a librarian'.[21] These depressing findings echo those of Kuhlthau.[22]

Louise Moran provides one explanation of teachers' reluctance to engage in collaborative mediation with the teacher librarian. Moran astutely observes that those teachers who embrace the concepts of information literacy must also accept a shift away from the traditional view of the teacher as the prime source and arbiter of what is valuable or important information, towards a learner centred model of the information process. This implies 'a very fundamental shift in the balance of power away from the idea of the teacher as dictator of the terms under which success in study is deemed to be successful'.[23]

Another explanation may be the fear of loss of control by some teachers who are less comfortable embracing the notions of change, uncertainty or confusion. After all, 'advancing collaboration among staff in a school is an attempt to change the school culture'.[24] For example, Kuhlthau's model of the information search process moves through progressive stages *of initiation, selection, exploration, formulation, collection* and *presentation*. During her research project, Kuhlthau discovered that the third stage, *exploration*, was 'unexpectedly the most difficult of the entire process',[25] as participants experienced a 'sharp increase in uncertainty and decrease in confidence after a search had been initiated during the exploration stage'.[26]

It is hardly surprising that some teachers, used to being the 'Sage on the stage', might exhibit a reluctance to engage in a process which will downgrade them from a position of 'confidence' to one of 'uncertainty' or 'confusion', subordinate to that threatening, unknown quantity – *the expertise of the teacher librarian*. As Moran[27] comments, 'Very few people (would) wish to give up the power that they have', particularly to a possibly unfamiliar and untried colleague from another department.

Conclusions: aiming to achieve the critical mass

What catalysts can be employed to expedite the conversion of teachers to the realisation that collaboration brings measurable benefits to themselves and their students? The answer may lie in the introduction of products or services calculated to reduce the anxiety level or confusion felt by some teachers venturing into the possibly uncharted waters of constructivist research processes. For example, cheerful, reliable and immeasurably patient staff who deliver a range of quality services in a timely manner, while generating a positive atmosphere regarding library matters, are critically important team members. Reinforcing the teachers' perception that they remain in control of the various stages of the information seeking process, is an important component in ensuring continued and future collaboration.

Must all members of a faculty be won over individually, or are there economies of scale? Herrmann[28] espouses the concept of critical mass. 'When enough individuals have achieved competency in a common area (and) can be focused on a common task, it is possible to achieve a critical mass. When that happens, the combined creative potential can become not only extremely powerful but also self sustaining'. Although referring to team creativity within a business environment, the analogy can just as effectively be applied to the collaborative process involving teachers and teacher librarians.

How many staff must be won over to the concept of collaboration, in order to achieve the flow on effects of critical mass within their faculty? The number seems to vary, according to the status of the collaborators within each faculty group. Two or three dominant luminaries may be sufficient to achieve critical mass within one department, whereas a greater number will be needed to effect change, if the teachers in the collaborating group are subordinate members in the departmental pecking order. On the other hand, we may find that we only need a single member in order to achieve a critical mass, as long as that person happens to be the key decision maker, the school principal. Webb and Doll[29] have noted, not surprisingly, that the endorsement of the school principal appeared to be a factor in the success of the *Library power* information literacy program that has recently been conducted within cooperating schools.

Within a school culture in which collaboration is not the norm, building a relationship of mutual trust and respect can be a lengthy, but ultimately rewarding process. According to the accepted definition, information literate persons are 'those who have learned how to learn'.[30] In essence, 'they are people prepared for lifelong learning'. This is certainly the ideal to which, as educators and information professionals, we would all aspire personally, as well as on behalf of our clients.

Understanding our own strengths and weaknesses as teacher librarians, as well as the individual differences of our clients, can facilitate a greater understanding of the processes that shape meaningful collaboration. What develops over time can become, in fact, a fruitful three way partnership between teachers, students and the teacher librarian. Hopefully these attitudes will be perpetuated by subsequent generations of teachers and student researchers. Teacher librarians who persevere and strive to deliver these outcomes will inevitably produce a clientele of library users who are true believers in the benefits of information literacy, confident in the relevant processes and well equipped to become lifelong learners.

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WORKSHOP DISCUSSION TOPICS

Battle of the Planets or What happens when 'process approach' librarian meets 'product oriented' teacher?

Picture this 'critical incident' in the school library.....

Two teachers recently were recently asked by their departmental superior to preview and evaluate an educational CDRom. The trial copy lay in the library, in the safe keeping of the teacher librarian. One of the teachers arranged to preview the CDRom in the library. After the exercise was concluded, the incident was related by the teacher librarian, as follows:-

Act 1 Scene 1: 'Collaborative librarian wins new clients': *the teacher librarian's version*

'I had advised the head of department that this CDRom, which I had previously evaluated for basic functionality, required further subject specialist evaluation in order to ascertain its relative role within the curriculum. The subject of the CDRom was energy conservation, presented in the form of an interactive game designed for children.

Within a few days I received a telephone call from Lucille, a young teacher who had a reputation for being 'good with computers', although she rarely brought classes to the library and never visited herself. She and a colleague (also a sporadic user of our services) requested access to the CDRom, having been asked by the head of department to assist in the testing.

Delighted at the opportunity to welcome two relatively nonusers to the library, I arranged for them to come over in a free period, with a view to them occupying a quiet room where they could test undisturbed. Unfortunately, the computer in this room was found to be faulty, so I arranged for access using a computer in the main body of the library. The testing had only just got underway when I noticed that this computer also exhibited a fault, despite having just been repaired by technical support. I relocated the CDRom and its test team to my own computer in the library workroom.

After starting the program for the two teachers, I maintained a discreet distance, since this was a genuine test of user friendliness, as well as suitability for use within a specific curriculum area. From a distance, I was able to observe that the teachers were engaging with the interactive program, with some evidence of interest. Eventually they reached a critical point where the program appeared to be insolvable. Without a solution, the planet was doomed!

I could empathise with the teachers' dilemma. I had also run into the proverbial brick wall at this point in the program, necessitating an emergency telephone call to the producers of the CDRom, for an explanation of the solution to the predicament (thank goodness that the product was Australian made). Although I possessed the key to the dilemma, I was hesitant to flaunt my knowledge before the perplexed teachers, who, with their younger mindset and computer literacy skills, were more than likely able to find the answer for themselves.

It was only when their frustration was clearly mounting that I stepped up to the pair and asked if I could suggest a way around the problem, explaining that I has also been confounded at this point in the program. They were pleased to accept my assistance. The problem area was resolved, the game concluded and the earth was saved. A triumph for collaboration between teachers and librarians!'

So thought the gratified teacher librarian.

Three days later, the teacher librarian was chatting with a colleague, a frequent library user who worked in the same department as the two CDRom evaluators. 'You certainly put Lucille and Miranda in their places, the other day', she chortled. 'Serves them right. They think they know everything that there is to know about computers, yet they know nothing at all about (information literacy)'. The startled teacher librarian

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begged to hear more. With high glee the teacher related a conversation that she had overheard that morning:-

Act 1 Scene 2: 'The librarian from hell': *the teacher victims' story*

'We were commanded by our boss to come to the library to review this CDRom. Why this was necessary, when we employ a specialist librarian for this purpose, I do not know. All *she* ever does is play on the Internet, while we have exam papers to mark!

When we arrived at the library she sat us in this damp room with a computer that did not work, then dragged us into the middle of the library, surrounded by noisy, nosy students, to sit in front of another computer that didn't work.

Finally she pushed us into a corner in the library workroom, where we had to conduct the testing surrounded by library people gossiping and mending books and things. After starting the program, she took off like a rocket and positioned herself over at the desk, from where she proceeded to *stare* at us for the rest of the session. It was so uncomfortable and embarrassing!

When we ran into problems, she didn't even come over to help. Only at the end, when she proceeded to demonstrate the correct solution. If she knew the answer all the time, why didn't she bother to tell us, in the first place'?

QUESTIONS FOR DISCUSSION

- In hindsight, how could the teacher librarian have structured the experience more positively?
- How can the teacher librarian contrive collaboration within a school culture in which the teaching staff have traditionally operated in a relatively competitive collegiate environment?
- What are some of the biggest challenges to converting clients from a product to a process centred approach to the research task? How does this impact on the teacher librarian's role as facilitator of information literacy?
- What are some strategies for winning over 'product centred' clients to a 'process centred' approach to the research task?

SECOND THOUGHTS ABOUT INFORMATION LITERACY

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Abstract *This paper comments on the phenomenon of information literacy and the way it is constructed by the library professions. It examines the connotations surrounding the nominalisation of information literacy in relation to the wider social and cultural communications environment and takes a perspective which frames information literacy as a component of the broader literacy and communications revolution. As such, information literacy is similarly subject to mediation by cultural ideologies as are other literacies. Finally, in the light of these analyses a critical account is offered of information literacy as an ideological product in service of librarianship as much as its clients.*

Literacy, information literacy and the school library

The term information literacy has emerged in the professional discourse of school librarianship with urgent persistency and universal endorsement. As a school librarian and within this context, however, there are a number of aspects associated with this phenomenon which have set me thinking.

I find myself questioning the constructions of information literacy represented in the professional literature of school librarianship for a number of reasons. Collectively, they have an indeterminate quality which seem to encompass anything and everything: from computer competencies, search engine savvy, standards and formulae for cognitive skills and metacognitive processes, right through to a philosophy of learning how to learn, personal mastery and leadership. Added to this, the strongly print, bibliocentric logic of information literacy seems to me to be inappropriate for the anarchic environment of digital information. Although there has been speculation and discussion about new digital literacies, the informative aspect of digital communications seems to have overshadowed these. Information literacy has flourished whilst little attention has been paid to the emergence of new and different digital literacies.

Green[1] proposed replacing the notion of the information society with that of a learning society, a mind shift also taken up in the work of Todd.[2] [3] This trend is a mutual cause for teachers and teacher librarians alike, but the initiative has been embraced by the library professions with such enthusiasm and renewed opportunism that they appear to have appropriated it, promoting information literacy as a discrete literacy synonymous with learning how to learn, and generated by information specialists. This has not been without some unintended effects; one is the way that the intersection of curriculum, information and information technologies has emerged in schools as a site of territorial instability; another has been the sometimes divisive impact on working relations between teachers and teacher librarians.

To be literate in the world of digital information necessarily means to be literate in the world of digital communications. So, if I define literacy as making meaning in a two way flow of communications, where does literacy end and information literacy start? Why is there the degree of separation between literacy in the digital communications environment, and information literacy?

Most teacher librarians would find this stance an over simplification, because their construction of information literacy is invested with far more than simply being operational in a digital communications environment, or merely making meaning in a two way information flow. But at a time when it is possible to broadcast information services through local area networks, there is an inevitable, growing trend for members of the school community to become independently operational and interactive with digitally mediated information and to develop know how and savvy without the benefit of the finer spin that information literacy might add to their endeavours.

These issues have prompted me to have second thoughts and to take a critical look at the information literacy movement. They are interconnected, but rather than discussing them as separate themes, I approach them through the following subset of topics which provide a broader and more revealing set of frameworks for their analysis.

My thoughts are based on observation and experience within the sphere of school librarianship. It is sometimes difficult to give voice to misgivings about one's profession when they run against popularly held perceptions and practices. This being the case, I have found it useful to employ James Gee's concept of Discourse to enable me to step outside my professional library discourse to critique it from my position in another, that of my research studies.[4] Even so, this has still proved difficult at times because issues of literacy, information and text are common to both discourses. Nevertheless, reading in the broader discourses of education and literacy has been helpful to me in explicating the affiliations between ideology and discourse, that is, the underlying generalisations which I believe motivate the information literacy movement.

The phenomenon of information literacy

Information literacy is a phenomenon of the nineties and because the concept has been formed so recently, our understanding of it has not yet firmed so that we are able to define it succinctly in a way universally acceptable to all. Because it is a literacy practised within a communications environment of continual change and development, perceptions of what information literacy actually is tend to be various and variable. Even within the professional literature of librarianship, a broad range of perceptions and ideological stances find voice according to the viewpoint of the writer. There is no shortage of discussion about what constitutes information literacy, but my purpose in this paper is not to define information literacy, but to discuss it as a phenomenon with special significance for the profession of teacher librarianship.

The body of written work about information literacy is so great that I have felt it more useful in this paper to confine reference to a limited number of resources. I have drawn from the American Library Association[5] because its concepts guide this conference, and have also influenced Australian concepts. Another is *The information literate school community: best practice* edited by Henri and Bonanno,[6] a recent collection of essays reflecting the work of eminent practitioners in the field of school librarianship. I have also included *The seven faces of information literacy* by Christine Bruce,[7] because this work gives such comprehensive coverage of, and commentary on, the prevalent models and understandings of the information literacy in Australia.

Many librarians hold to the concept which describes information literacy as synonymous with knowing how to learn, as a set of generic strategies and skills. They believe that these strategic steps are the essence of information literacy for the very reason that they transcend technologies and communication media. This interpretation finds an ideological match with the statement by the American Library Association's Presidential Committee on Information Literacy which described information literate people as

> ... those who have learned how to learn. They know how to learn because they know how knowledge is organised, how to find information, and how to use information in a way that others can learn from them, they are people prepared for lifelong learning, because they can always find the information needed for any task or decision.[8]

This is a fine definition in so far as it gets to the human heart of the matter by focusing on people and placing information in a human perspective; but it falls short. For me, it is too humanist, too pure and overly self conscious in its omission of the material conditions through and in which information literacy is practised. Given the impact of digital communications technologies on society, and the coincidental emergence of the phenomenon, I believe that a definitive interpretation of information literacy today cannot afford to ignore the material conditions of either information or literacy, or the broader social, cultural or economic context in which information literacy is practised.

By comparison, and with the passage of time, *Information literacy: a position paper on information problem solving* recently published by the American Association of School Librarians[9] and *Nine information literacy standards for student learning*,[10] move to a more specific construction of information literacy as a spectrum of specific attributes, skills and metacognitive steps derived from the information research skills process which, in turn refer back to the influential work of Kuhlthau[11] and Eisenberg and Berkowitz.[12]

Perhaps the majority of Australian teacher librarians would claim that their understanding of this phenomenon lies somewhere between these two extremes. This ground is usefully charted by Henri and Bonanno.[13] Out of the twenty chapters in this collection, at least fourteen make specific reference to the dilemmas and understandings surrounding information literacy. Notably, the construction of information literacy in each endorses the model promoted by the Australian School Library Association[14] which, in its turn, also shows the influence of Eisenberg and Berkowitz.[15]

Although her research was located in the tertiary domain, Bruce's work[16] is also significant to the school environment because it offers a fresh approach to information literacy. Her theory moves away from the conventional constructions and presents an alternative model which features the relational aspect between the learner and the information environment. Also of great value in Bruce's text is the historic and detailed account she provides of the prevailing approaches to information literacy. The influence of these can be seen in current models of school information literacy practices.

For the purposes of this paper it is significant to note that these texts document and confirm that the dominant paradigms of information literacy in schools hark back to the apparatus of print and print oriented learning cultures.[17] [18] Amongst other things, they emphasise the established role of behaviourist techniques, the importance of acquiring skills and of implementing set processes which are characteristics symptomatic of learning in an earlier communications era.

Langford[19] acknowledges that perceptions of information literacy still remain multiple and various. Yet, despite this indeterminate quality and outdated origin, information literacy has an established priority on the agenda of librarians as a discrete literacy, and as the subject of endless professional writing and dedicated conferences. This has been the case for some years now, nationally and internationally, so its importance cannot be discounted, but I am personally puzzled by the unquestioning perpetuation of incompatible learning practices into new modes of communications.

The information literacy phenomenon has gained considerable momentum with no shortage of advocates at its crest. In this paper, I travel in its wake, taking a second perspective on the assumptions that surround and support it.

The nominalisation of information literacy

I believe there is some value in having second thoughts about the significance of the words we have so unconsciously accepted for this 'new' form of literacy. While we can only approximately pin down a meaning or definition, we can question the words. I query the apparent neutrality of the term information literacy and its unarguable, well intentioned connotations. By now, we are so accustomed to these words that they seem entirely innocent. I believe the term accrues more meaning than the two separate words which comprise it. The social and cultural values we associate with each word mediate their connection so that, coupled together in a special communications context, at a time of educational and curriculum reform, they are endowed with urgency and extra significance.

The emphasis on information connects with a long standing and deeply embedded social and educational agenda which equates information and knowledge with power and freedom. This equation has intensified since the advent of the Internet and the World Wide Web so that information has also come to signify prosperity and success, ambition and opportunity, as an economic resource. Our profession already positions us within a mindset that perceives the world in terms of information including the information society and the information economy. Both of these terms extrapolate to the notion of the global society. With just a very slight skewing of the professional information/empowerment mindset towards the economic, global construct, information literacy can be seen to signify as passport to the global discourse. What sort of warranty comes with the promise? Does information literacy refer to how we locate, understand and utilise information, or does it also make reference to how we 'read' the world?

Linking literacy with information creates a term charged with social values and emotional anxiety. Literacy is always the subject of contestation and a perennial topic of public scrutiny. It is a source of constant and sensitive tension between employers, educators, government and the press. When we add literacy to information, we augment the tension by bringing it more closely into alignment with issues of opportunity, competition, winning and losing. Nominalisation of a differentiated literacy subscribes to a particular sort of world order comprised of class based affiliations (symbols analysts, knowledge workers, service providers) within a knowledge based society.

Librarians and teacher librarians themselves have been alert to the opportunities this scenario has offered their profession for leadership. Their familiarity with automated information systems positioned them advantageously to assume leadership in this field. The concept of information literacy evolved from library research skills and information skills, following a long and dedicated campaign by teacher librarians to incorporate these skills into curriculum, across changes in communications and information delivery. After thirty years of struggling to secure a critical role in education, the switch from service to leadership has proved opportune, if not irresistible. I am wary, however, that leadership for cultural change offers opportunity to institute a particular view of the world, and that it is also prey to fulfilling instrumental agency in the service of a less visible but potent commercial interests and global trends.

I do not question the connections educators are required to make between literacy, market trends and the promising potential of information. I agree with Lankshear[20] that 'literacies are inseparable from larger social practices', but I also suggest that we seem not to recognise that we are only a short distance down the track of reconceptualising literacy in the digital environment, and, more importantly, that this is a mutual cause across the borders of teaching and librarianship. It is useful to be aware that the insistent momentum of information literacy, as promoted by teacher librarians, has potential for fracturing and factionalising the general literacy movement. Librarians and teacher librarians constantly fret about the unwillingness of their teacher colleagues to incorporate information literacy into their teaching practices, but they do not often stop to query their own view of the world, to see it from a specialist, self interested view, rather than from a world view. Nor do they ask if their teaching colleagues and their subject associations might have a different pathway to the same goal. I wonder how helpful it is, against this context, to proclaim a differentiated form of literacy as a universal panacea for educational reform.

Perhaps I am being overly critical of the information literacy movement. Perhaps information literacy will achieve its purpose and, at the same time, serve as a useful bridge for the transformation of literacy in the new communications culture; but it seems more likely to me that it is in danger of being seen by others outside of our profession as the attempt of a specialist profession seeking to claim and maintain its exclusive stake in the information industry at a time when information has become the deregulated currency of the community at large.

Information literacy as a component of the broader literacy and communications revolution

This section addresses the degree of separation between literacy and information literacy. Here I take a perspective which problematises the phenomenon of information literacy by comparing it with the ways that our perceptions and production of text and literacy are changing (or not changing) in response to digital communication technologies. In the previous section, I have already established how the social values associated with information have bestowed special impetus on the information literacy movement and suggested that this impetus has eclipsed the general literacy movement. The interplay between information and communication raises interesting questions for me. Why is it that information features so prominently over the means of communication we use to access and manipulate information, when these two components are so patently interdependent and equally revolutionary? To be published, information is dependent on one sort of communications technology or another, so to be information literate also means to be communications literate.

The major issue facing educators is the enormous shift of literate practice from the culture of one communication technology (print) into that of another (digital). I am inclined to think that dwelling on information is a means of side stepping the larger issues of literacy under the potentially transformative effects of digital communications.

We have experienced ongoing changes in our communication practices during the past decade as we have become initiated and acculturated, in varying degrees, into the culture of information communications technologies. But, through all of this, we have retained our conventional notions of literacy. Too often we have understood literate practices of reading and writing as simply transferable from conventional print based media to computerised media. Visual embellishment provided by software such as PowerPoint can falsely lull us into believing we have achieved literacy in the digital medium when in fact we have simply managed to domesticate this new medium into our conventional habits and patterns of literacy.

While new perceptions and practices of digital literacies appear to be taking place very slowly, information literacy has emerged far more prominently and aggressively. Initially, engagement with information texts in these formats was unfamiliar so the concept of information literacy suggested a means of facilitating access, but more recently in the school environment and in the professional discourse, it has assumed far greater import. Information literacy is synonymous with learning how to learn, with survival skills, with personal mastery, a life creed. These catch cries refer mainly to empowerment achieved through the process and concepts inscribed in the 'Big Six' skills approach.[21] Developed in the culture of print technology, this approach has underpinned library research skills, information skills and information literacy in turn. Its proponents claim validity in the belief that it transcends communication technologies, a stance which reveals a static perception of learners and learning. Belief in the process approach indicates a desire to fix the subjective identity of the learner in the rational logic of print literacy, thus transmitting the social relationships of one communications technology into another.

The tendency for transferring old literacy practices into the new media is again witnessed in the dominant paradigm of information literacy. It reflects an interesting mix of the will to domesticate new technologies and, at the same time, to reflect larger social and economic discourses. Tuman[22] has discussed information as an economic resource and Poster[23] [24] explains how communication modes have the potential to mediate subjectivities within a set of social power relations. The process of information literacy itself can be seen as a means of production in which information is a product or an economic resource. It works to domesticate the electronic communications environment by constructing the learner as an economic unit for the production of knowledge, for adding value, mastering a code to achieve competence. People are assessed according to a set of attributes generated in an earlier mode of communication. The process encodes an organising set of concepts which work to produce a governing norm; it exemplifies the way in which ideological codes seek to replicate and self duplicate the interests they represent. I suggest that information literacy might be described as a technology itself, regulating by code and ideology, a security chain anchored in the logic of print culture. The digital world of information is not as stable as that; new generations of software and frequently mutating protocols mean that know how and skills are subject to endless change. Recipes for information problem solving continue to objectify both learners and information. They insist on a totalising, 'how to think' model which is out of step with the digital communications environment; they regulate the unregulated and constrain the evolution of adventurous communications practices and errant subjectivities.

For these reasons, I find it hard to accept the euphoric claims made for information literacy. Instead, I recognise it as a response which subtly succumbs to the familiar influences of print based culture in yet another instance of domestication of new technologies. The symptomatic will of librarianship to establish order in the chaos of new information systems, has sought to superimpose a familiar system of logic, a product of print literacy, onto a new medium. The material arrangement of knowledge on the book bays of our libraries manifest the librarian's predisposition to systematise and organise information. Now, I suspect that despite our reputation for being at the cutting edge of communications technologies, information literacy reveals teacher librarians are practising their own special form of resistance to the mediating effects of information communications technologies, and are failing to understand that the message cannot be separated from the medium.

For my own part, I am troubled by the universality and totalising effects of this movement, by the impetus of a phenomenon so variously understood, yet subject to such uncritical, fervent allegiance. Against the seemingly universal endorsement of information literacy, I am troubled by my personal misgivings and the subsequent ambivalence I experience. In our profession, the status of information literacy is akin to that of motherhood, because it traverses the teacher librarians' heartland territory of knowledge and learning, and calls on their unshakeable faith in the integrity of the time honoured creed for learning how to learn.

The intersection of information with digital communications has brought us face to face with new and different forms of text, unfamiliar protocols for connecting to information, hypermedia and extraordinarily heightened facilities for manipulating and publishing information. When we operate in this environment we are practising a new concept of literacy, maybe only passively at first, by looking and reading; but when we interact and participate, become operative in this environment, we become actively literate in that mode. We read and write simultaneously in the realms of digital information and digital communications. Literacy or information literacy?

In fact, we find that the new environment is different but not really more difficult. Software and interface programs offering keyword searching, Boolean logic and hyperlink connections make access to information easier than did the hierarchical and anachronistic organisation of knowledge in card catalogues, print indexes and abstracts. The construction of information literacy problematises information itself as well as the new communications environment. Bruce[25] depicts the historical development of the concept of information literacy as a means of negotiating barriers which 'prevent people from exploiting their information environment'. It is as if those who have travelled the new territory first have come back with the news that it is difficult, and special codes of practice are required to find (or mediate) the way. They have problematised the both the territory and the means of travelling and come up with a whole new industry along the way.

Information literacy : profession, product or ideology?

I think that teacher librarians have been overly preoccupied with this phenomenon. Caught up in the desire to promulgate information literacy, their view has become far too narrowly focused and their claims far too expansive. They have been distracted from the enormity of the conversion of literacy practices that is currently underway. I want to argue from a broader literacy perspective that information literacy could be seen as a temporary, and possibly unnecessary construction; that within the communications revolution we are currently experiencing, information, communications, text and technology merge so inextricably that it is not only invalid to single out information for a discrete form of literacy, but it is misleading and potentially divisive in its outcome.

Ever since the term information literacy was first coined, librarians and teacher librarians have perceived it as their special responsibility. As information specialists they have made the promotion of information literacy their particular crusade, devising programs and strategies to facilitate and enhance interaction between their client communities and the world of information. In doing so, they have attempted to pin information literacy down into something concrete and recognisable, something that can be talked about, addressed, applied. But despite their best intentions to promote and propagate information literacy throughout their communities, they seem to have turned it into their own industry so that others outside of the library profession have also come to see it as the special business of librarians.

Literacy, critical literacy, information, text and computer mediated communications are components of the information literacy phenomenon. Clearly, they cannot belong exclusively and solely within the sphere of teacher librarianship, but together, under the banner of information literacy they constitute a life raft for a profession in a time of cultural crisis and change. That teacher librarians are intensely sensitive about the business of information is sometimes evidenced in turns of speech and metaphor referring to crucial aspects of the body. For example, 'Teacher librarians deal with information. It is our life blood',[26] and 'Electronic library service provision: providing oxygen for teaching and learning'.[27]

They have always had a specialist stake in information, so it is not surprising that this interest should now translate into a professional investment in the phenomenon of information literacy. From the earliest days of the Internet and information literacy, teacher librarians were concerned about information: too much information and the prospect of unfettered access; about issues of authentication and validity; that information must be approached with a particular mindset; about the fact that others in the community can now assume exactly the same relationship with information that was, until recently, the special professional prerogative of the teacher librarian; in other words, that their special status in relation to information was under threat. I believe these concerns have fuelled the momentum of the information literacy movement.

'Information' emerges as a highly sensitive nerve spot. Within the discourse of librarianship, information literacy valorizes information in accordance with powerful global discourses of economics, knowledge and opportunity; but if we understand information as a crucial keystone of the teacher librarian profession, we can also interpret the construction of information literacy as a means for a profession to sustain its position of power and professional status during a time of threat. We glimpse how the ideological assumptions which appear to serve their learner clients also work invisibly to protect and secure the status of professional discourse. Fairclough[28] points out that ideology is most powerful when invisible, disguised within 'background assumptions'. When a discourse is threatened with instability, or contested, its members act to defend it and their position within it.[29] The swift rise of information literacy could be interpreted as such a response. By all of this, I do not mean to suggest that the construction and promotion of information literacy is the product of sinister, ulterior motives, or even the result of a conscious strategy for survival at a time of uncertainty, but I do mean to point out the active relationship between discourse, ideology and power, and by doing so, to throw a different light on the role of information literacy. Hard won positions of power and status always require defending; teacher librarians know only too well that when it comes to information, the discourse of information technology looms menacingly nearby.

The library professions, in and out of schools, have constructed information literacy as an idealised response to their concerns about information, a response that they would urge their teaching colleagues to pick up. But it has to be remembered that information literacy has not evolved from across the whole learning community, and, effective as they believe it to be, it is a library product, a construct for the right way of dealing with information, the best way, the library way. Despite their best efforts, and many years of struggle, teacher librarians have not really succeeded in collaborating with teachers and incorporating research and information skills widely across the curriculum. By way of compensation, however, their familiarity with automated library systems placed them in an advantageous position for making use of information technologies as the catalyst for a renewed campaign with information literacy.

The success of this venture has been mixed, perhaps due to resistance by teachers who possibly sense the need to defend their own ground in the matter of information, curriculum and learning. The effects of the campaign can be gauged by the comments of teacher librarians in professional journals. All too frequently we read that: *Teachers should . . ., Teachers need to ...., Teachers do not have the background ...., Students must* .... I could cite many other examples but you must recognise this approach and its language. The outcome is, of course, the reverse of what teacher librarians intend.

Nonetheless, perceptions are changing. The establishment of school intranets giving ready access (via the Internet) to information that was once confined in the library has had the effect of bringing information into everyone's literacy practices. The earliest papers and workshops of information literacy specialist, Ross Todd had special relevance to the work of teacher librarians, but more recently[30] his emphasis frames information literacy as the responsibility of all educators, whether in the classroom or the library. It is pleasing to register a shift in perceptions about information literacy in the ranks of tertiary educators.

Independent, self sufficient practice on the part of autonomous learners, students and teachers, is evidence of further change. As a learner practitioner in this new information environment, I observe my own patterns of practice and also those of others whom I deem to be competent. Our patterns of research practice are marked by the quirkyness of individual methodologies, of just in time advice, guidance and discovery. I find myself asking how crucial can institutionalised information literacy be, if learners of all ages, in and out of school and with no assistance from professionals like ourselves, also find their way around the World Wide Web, email and chat programs; install and run software; negotiate all sorts of digital texts, recreational and otherwise; and simultaneously discriminate between what it is useful and what is useless to them?

Perhaps it is relevant that most of my observations are made within a privileged, reasonably well educated, middle class milieu, but more relevant than this is the fact that observation indicates that access and motivation are highly potent factors for achieving literacy via new technologies and that critical thinking is a crucial ingredient. I argue that, while learning might be assisted by information literacy, it cannot be confined to one particular sort of literacy or universally achieved through a special, set, logical research process. Added to that, I suggest that learning experiences in a digital communications environment can be quite contradictory to the logic of information literacy, that they are likely to be characterised by an anarchical, eccentric quality and to invariably employ a continuum of literacies.

So, it seems to me that in constructing information literacy as a specific, quantifiable process, our profession has hijacked a portion of a much larger movement. I wonder if information literacy is not the product of a profession too close to its subject. The long, long years of engagement with library research skills, with the information process and with information problem solving seem to have found replication and renaissance in yet another initiative. From our own specialist professional perspective on information, and paradoxically in the name of empowerment and liberation, it seems possible that we have set about weaving a further web of our own.

In her chapter *Advocating information literacy*, Victoria Pennell[31] says the teacher librarians now prefer to see themselves as 'gateways' to information rather than 'gatekeepers'. This may be so but I query the beguiling neutrality of terms such as facilitator and gateway, and wonder about the degrees of difference between gatekeepers and gateways. What does the construction and institution of a new and specialist form of literacy by a particular profession mean in terms of social relations between learner and teacher librarian as facilitator, in terms of control and authority in a specialist field, of professional status, of the mystification or obfuscation of information and communication? I wonder if this insistence on a specialist stance in relation to information is not an ideological one based in the power of expertise.

Conclusion

By now you will have gathered some idea of how and where my concerns about the information literacy business have come from. My purpose has not been to negate information literacy but to establish a stance which allows for a more critical perspective and some professional self scrutiny. From this viewpoint, I want to suggest that information literacy tells only a part of the literacy story and that as a phenomenon, it represents a particularly sectoral (ie the library) point of view

I believe that as librarians and teacher librarians, our preoccupation with information literacy has distracted us from coming to terms with a broader overview of literacy in the new communications environment; it has blinded us to that way in which we have been positioned materially, culturally and socially by communications media; it has led us to foster an industry that maximises status by trading on socially and culturally weighted insecurities and sensitivities; it has given the impression of appropriation of a field of knowledge rather than propagation, and has affected the divisions between sectors of teaching communities.

At this moment in communications history, perhaps it is time to look beyond the current influence of and preoccupation with information and focus more on a more encompassing shift in literacy per se. If we were to redirect our efforts towards reconceptualising literacy in this new technological medium, we might arrive at a concept that underwrites all dimensions of being literate, that ignores sectoral boundaries of teacher and teacher librarian, that recognises information literacy as part of a continuum of literacies.

My theories and beliefs about information literacy obviously run against the grain of most of what is written about the subject by others who have been engaged far more actively and eminently than I have in the professional forum. Nevertheless, I have been an observer in the field for a long time and feel that insight is to be gained by raising these questions about the phenomenon of information literacy and its significance to the profession of teacher librarians.

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INTEGRATING INFORMATION LITERACY INTO THE HEALTH SCIENCES CURRICULUM: LONGITUDINAL STUDY OF AN INFORMATION LITERACY PROGRAM AT THE UNIVERSITY OF WOLLONGONG

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In times of change, learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists. Eric Hoffer

Abstract *In 1997 the Department of Nursing and the Faculty Librarian, Health and Behavioural Sciences at the University of Wollongong developed a curriculum integrated information literacy program for undergraduate students. The aim of the program was to provide students with an awareness of the discipline's literature and the skills required to locate, retrieve and analyse the required information. With these fundamental skills students would be able to more effectively develop an awareness of, access to and appreciation of information and its application. Ideally, such a program would enhance our graduates' ability to become lifelong learners. Given that the program was designed to ensure that participants acquired skills equipping and encouraging them to become lifelong learners, it was appropriate that the long term impact of the program was evaluated. The purpose of this paper is to describe, and examine the results, of the longitudinal evaluation of the program.*

Background

The short life of technical and professional knowledge necessitates that graduates have generic skills and attributes enabling them to continue to find out what they need to know once they are working in their chosen profession. More now than ever before students must be information literate, that is, have the ability to use information and technologies effectively to find, select and use information.[1]

Snavely and Cooper[2] provide an excellent summary of the pros and cons involved in the issue of defining information literacy. The longest lasting and most often quoted is that proposed by the American Library Association

> *To be information literate a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information*[3]

While it is commonly documented that undergraduate students require assistance in acquiring and developing the skills that will make them information literate,[4, 5] many librarians in academic settings are struggling with how best to approach this need. In 1997 academic staff in the Department of Nursing and Librarians at the University of Wollongong undertook a collaborative project, which was designed to embed information literacy and research skills into the core Bachelor of Nursing subjects NURS121/132 (*Foundations of nursing care*). This paper examines the long term results of the program.

The program

O'Brien and others[6] identified the four variables of motivation, relevance, integration and assessment from the literature on library user education. These key elements were integral to the planning and implementation of the NURS121/132 program. Students' information searching skills were measured by the completion of an information literacy task at each skill level, for which credit points were assigned. All of the practice examples were taken from the content of the nursing curriculum, ensuring that the topic was directly relevant to student needs. Example 1 shows how the series of learning activities and assessment tasks were used within the information literacy program. For a complete outline of the program and assessment criteria, the reader is referred to the works by Wallace and Shorten[7] and Faricy.[8] The NURS121/132 program was designed to introduce students to a range of research skills in a timely manner, using a scaffolding effect in an attempt to ensure proficiency in one area prior to moving on to the next skill level.

Learning Activity 1: In the scheduled lecture time of Week 2 Autumn Session, the Faculty Librarian provides a lecture on how to read and understand the components of a bibliographic citation in order to find a library item. In Week 2 tutorials the students have scheduled time in the library to undertake Assessment Task 1. The tutors are available to assist with any questions and the Faculty Librarian is 'on alert' for trouble shooting activities during this scheduled library time.

Assessment Task 1: Each student is given a list of some items which are held in the library. There are a number of different lists so that students are compelled to carry out at least part of this task on their own. Students are not given the full citation except perhaps for those relating to journal articles. Instead they are given clues. This assignment has been structured so that students need to find items in a variety of locations within the library. Because this library research exercise is framed as a series of questions, it requires students to think about information rather than merely record it for later use.

Learning Activity 2: A second information literacy lecture is provided in Week 5 of Autumn Session. The title of this lecture is 'Search strategies'. The Faculty Librarian demonstrates the development and implementation of a search strategy related to specific assignment topics set for this particular subject. This lecture can involve reinforcement of certain aspects of the use of the library catalogue, use of databases and indexes. The tutors allocate tutorial time to the development of a search strategy and there is structured time available in the library.

Assessment Task 2: The assessment task involves

- Submitting a copy and a critique of a library search strategy developed in Learning Activity 2. Students are expected to develop an ability to evaluate their own intellectual processes and plan strategies to become more effective and efficient users of resources.
- Locating, reading and providing a list (in a specified reference style) of 10 items found in the library as a result of the search strategy

Learning Activity 3: Within tutorials, students are provided with short articles from mainstream magazines and are asked to describe the article in general terms then list as many positive features (strengths) and as many negative features (weaknesses) as they can. Students are then assisted to develop their 'point form' notes into sentences and paragraphs. As a result of this exercise students are able to write one general summary statement of their observations about the article and support this summary statement with reference to the strengths and weaknesses they have identified.

Assessment Task 3: This involves the students in undertaking a critical analysis of five of the items found as a result of the above search. Students will utilise the skills of criticism and analysis developed in Learning Activity 3 to analyse critically five of the resources located as a result of Learning Activity 2. This assignment is submitted in essay format and constitutes a preliminary version of possible future literature reviews. Assignment presentation and the fundamental aspects of essay writing are dealt with in a corequisite subject.

Information literacy program structure[9]

Evaluation

Methodology

Funding was secured to undertake an evaluation of the original 1997 program with a view to generating a model for curriculum integrated information literacy. The results of that evaluation[10] along with an informal evaluation of student perceptions after they had completed the modules are currently under review.[11] Given that the program was designed to ensure that participants acquired skills to encourage them to become lifelong learners, it was appropriate that the longitudinal impact of the program was evaluated. To this end, students who had undertaken the original 1997 program were requested to complete a follow up evaluation during their third year of study. The process included a follow up questionnaire (Appendix A) and participation in focus groups. Table 1 provides an historical perspective of the processes used to evaluate the program.

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1997	Autumn Session Week 2	*Pre test evaluation* Program students complete a questionnaire designed to establish demographics and to determine basic levels of information literacy and self reported confidence.
	Autumn Session Week 10 *	*Post test evaluation* Program students complete a follow up questionnaire designed to measure changes in information literacy skills and self reported confidence.
	Autumn Session Week 10	*Non program evaluation* Non program students from a two hundred level nursing subject complete post test evaluation form (control group) to measure basic levels of information literacy and self reported confidence.
1999	Autumn Session Week 10 *	*Longitudinal evaluation* Cohort from the 1997 program complete questionnaire (Appendix B) revised from 1997 version and participate in focus groups.

* included in the 1999 longitudinal study

Table 1: Historical overview of the evaluation process

A total of 53 students completed the questionnaire. In order to ensure the return of a valid sample of responses, the questionnaire was completed during scheduled tutorial times. In addition to the analysis of performance and self reported confidence, five focus groups were held in order to determine personal reflection regarding the library instruction.

Data analysis

In order to establish differences between post and follow up questionnaires, the data was statistically tested by a two sample T test assuming equal variances. The minimum required level of significance was set at $p<0.05$. All statistical procedures were performed using Excel version 5.0 on an IBM personal computer.

Results and discussion

Students were asked to rate their self confidence in a number of areas, including selecting and using electronic databases (question 8) and skills such as selecting appropriate dictionaries and producing a comprehensive search strategy (question 7), using a 5 point Likert scale.

The mean confidence levels of the 1997 post test group were compared with that of the 1999 Follow up group over several questions. The mean overall confidence levels of the 1997 post test group was compared with the 1999 follow up group. T test analysis revealed a statistically significant increase in student confidence in a number of areas. The results for question 8 (database searching) along with examples of each are shown in Table 2. Those with a probability of $p<0.05$ are indicated with an asterix.

Searching task	**Examples**	**t-test**
Choosing a suitable database	Requires student to identify which database(s) (eg *Apais*, *Medline*, *Cinahl*) would provide the best sources of information for a particular assessment task.	$t=3.31$ $df=124$ $p<0.01$ *
Constructing a search by defining terms and key words	Identifying key words: 'handwashing', 'infection control' and 'nurses techniques' from the assignment topic "Handwashing can assist in infection control. What techniques do nurses need to follow?"	$t=1.95$ $df=124$ $p<0.05$ *
Searching task	**Examples**	**t-test**
Combining	Requires the student to use the Boolean operators of AND,	$t=0.80$

searches	NOT and OR to confine or extend two or more 'simple' searches	df=124 p<0.43
Refining a search by broadening, limiting or using truncation	Using the truncated term nurs* to retrieve any records relating to nurses, nursing, nursing homes etc.	t=1.12 df=124 p<0.27
Using database features such as 'limit fields', year of publication etc	Limiting the year of publication to '1997-1999'	t=2.19 df=124 p<0.03 *
Selecting and down loading appropriate references/sources in a question	Using information such as the ISSN and abstract selecting the most useful resources and saving the search to disk, emailing it, or printing a hard copy	t=2.71 df=124 p<0.01 *

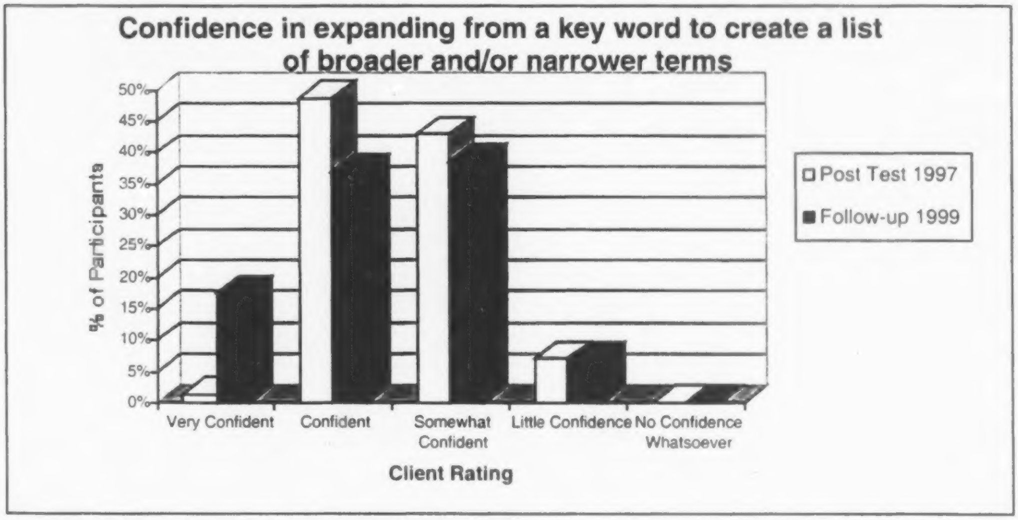
*probability: p<0.05

Table 2: Self reported levels of confidence relating to database searching

Explanation of table

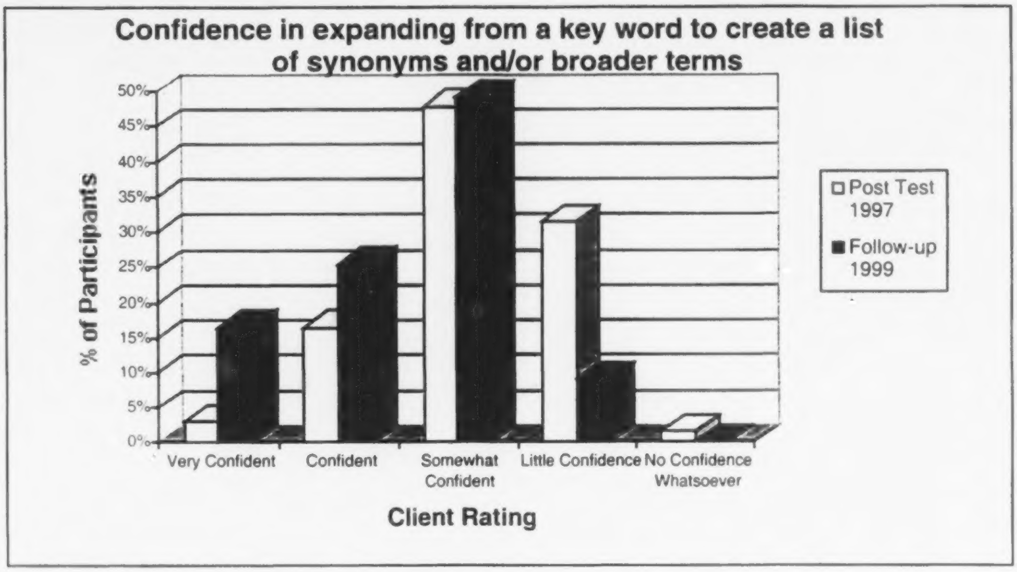
- t= t-statistic, which is obtained by comparison of the two means (1997 post test and 1999 follow up)
- df= total number of persons in the sample (1997 post test + 1999 follow up) (n-1)
- p= probability of the same results occurring each time, with a 95% confidence level (p<0.05)

When the mean overall confidence levels in the area of creating a list of broader and narrower terms were compared to each other, it was determined that these were statistically significant (t= 2.04, df=123, p=0.04). Graph 1 demonstrates the relationship of the results.



Graph 1:Self rated confidence in expanding from a key word

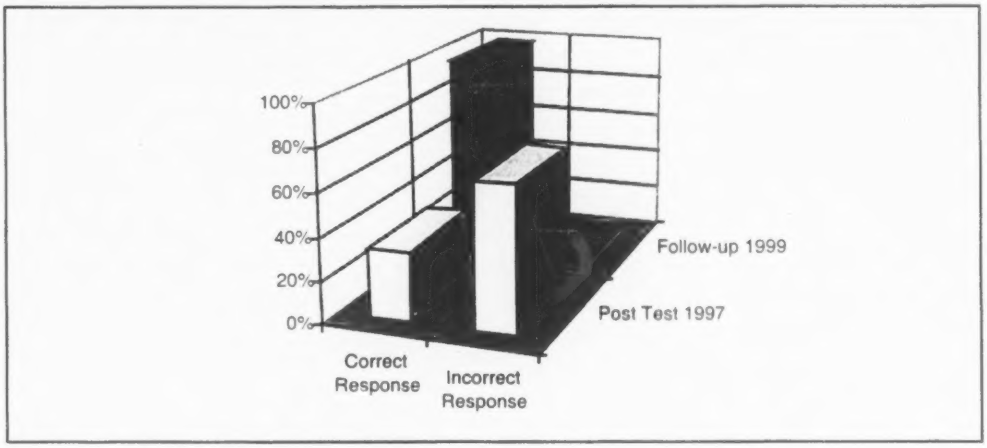
Graph 2, which represents data obtained from question 7 illustrates increased self reported confidence levels of students when expanding from a key word to create a list of synonyms and/or broader terms (t= 2.31, df=124, p=0.02).



Graph 2:Self reported confidence when creating synonyms

Other measurements included a comparison of mean confidence levels of students when selecting appropriate dictionaries and thesauri (t= 0.03, df=124, p=0.97), identifying key words in an assignment question (t= 1.24, df=124, p=0.22) and using research skills to produce a comprehensive search strategy (t= 1.45, df=124, p=0.15). No statistically significant differences were determined in these areas.

Graph 3 demonstrates the response to a question directed at determining student familiarity with basic research tools. Ninety eight per cent (n=56) of the respondents in the 1999 follow up gave the correct answer, indicating that most students at the very minimum knew where to start when looking for basic information on a topic related to nursing.



Graph 3: Determining correct library source to use

The statistical analysis determined an overall increase in the level of information literacy among the student cohort. The validity of these results can, however be questioned due to a number of variables. The lack of significant improvement in some areas could be attributable to a number of factors. Firstly, students may have misread or misinterpreted the question, especially those relating to books and dictionaries, as in their third year of study their predominant resources are journal articles followed closely by scholarly information available via the Internet. Secondly, the original 1997 post test results could be held to scrutiny, as the information literacy program itself may have created a Hawthorn effect, which is the phenomenon that occurs when interventions designed to bring about improvements in productivity are associated with temporary improvement merely because the changes have been tried, rather than as a result of the intervention.[12] Finally, the statistically significant improvements noted between the 1997 post test and 1999 follow up cohort cannot be definitively attributed to the integrated information literacy program, as there is no means for determining the maturation of the students in this area. In other words, they may have developed these levels of skills without the information literacy program.

Libraries are always interested in who their main competitors are. As part of the study, students were asked to identify the type of libraries they had visited in the six months prior to completing the questionnaire. There was a shift in demographics from the 1997 survey to the 1999 results, indicating that students were prepared to use libraries other than the University of Wollongong to obtain targeted information. Collation of the results from the comments section and focus groups, included in the qualitative research section of this paper highlight that possible reasons for this shift included perceived lack of relevant journal titles at the University of Wollongong, accompanied by repeated vandalism of the journal collection.

Qualitative evaluation

Summary of comments from library questionnaire

In addition to the quantitative method previously outlined, participants were invited to record comments on experiences with library searching. Results were coded to obtain relevant data. Of the 53 questionnaires completed, 36 (68 per cent) had recorded one or more comments.

- 47% (n=25) of the comments discussed a lack of access to databases
- 45% (n=24) reported on the frustration of using the databases to locate citations, only to find that they were not available in the Library
- 9% (n=5) made recommendations that the Library's holdings be linked to the databases
- 4% (n=2) expressed a desire to have journal articles available electronically
- 11% (n=6) commented on vandalism as being a major issue

In order to address these problems, students and staff are now able to access a range of databases, including *Medline* and *Cinahl*, via remote access. In addition, in order to address the problem of availability of journal titles and to reduce the impact of vandalism on students, it is probable that the University of Wollongong Library will subscribe to *Health reference center academic*, a database with some full text titles, effective from the year 2000. It is also planned, with an upgrade of the software which runs *Medline* and *Cinahl*, to link the database references to the Library's serials collection. This will enable clients to see at a glance what is available in the Library.

In addition to comments regarding databases, comments about the Library in general were recorded. One comment was testimony to the trials and tribulations of library research

> *I hate libraries and never want to see one again*

A number of positive comments were also recorded. One respondent commented that they had 'become much more confident and [their] knowledge of available resources [had] been expanded greatly'.

Library staff also rated a mention. While one comment was confirmation that the staff were willing to assist, a second comment indicated that staff were not helpful at all. This comment however seems to be directed at the frustration of the research process rather than the attitude of staff

> *At times the Library staff were unhelpful. Either the Library did not stock the journal, or if it was on the shelf the pages were torn out*

Summary of comments from focus groups

In addition to the questionnaire, focus groups were held with students from the original 1997 cohort. The purpose was to gauge student attitude to the integrated program. The sessions were conducted during scheduled tutorial times, in order to guarantee a useful sample.

In total five focus groups, attended by a total of 44 students were held. While all groups indicated that they were initially confused, frustrated and worried at the beginning of their first year of study, all conceded that it was because everything was new. Most of the students stated that they were aware of the link from the library assignments to their nursing studies.

A general feeling from all groups was that students now felt comfortable using the tools associated with professional nursing research. When asked if they could explain how their research skills would be developed in their professional work, several commented that they felt competent that they could use research skills to locate up to date information on a topic or procedure.

Comments made in the focus groups indicated that many students felt that the lecture and practical exercises using the databases such as *Cinahl* should be withheld until second year, stating that it had not been necessary to use these skills after the first year assignment. Students who felt that the module should remain suggested that a follow up session in second year would have been beneficial as a way of reinforcing the knowledge already developed, as well as providing an opportunity to develop more advanced searching skills.

When asked if the information literacy program had been of value during their three years of study, most students were positive, concluding that the program was a useful addition to their studies and should be continued. Suggestions for future programs included the introduction of a module on the Internet, and a brief follow up of the skills learned as the students progressed up the academic ladder. One student felt that it would be useful if a student from the previous year could speak at the initial lecture, detailing the value of the course from a student point of view, in order to stimulate enthusiasm for the program.

Conclusion

As Hoffer so adequately posits, *learners inherit the earth*. Librarians share the responsibility with academic staff for ensuring that graduates are information literate. The program outlined in this paper demonstrates one method of ensuring a curriculum integrated approach to information literacy. While there is no conclusive statistical evidence that participation in the program had a long term impact on students' research skills, the results of the focus groups lead me to believe that the team at the University of Wollongong is on target in its attempts to ensure that its nursing graduates become lifelong learners.

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The author gratefully acknowledges the assistance of Glenn Doney for his data input and statistical analysis

APPENDIX A

LIBRARY EXPERIENCE QUESTIONNAIRE

This questionnaire is about your Library experience. Read each question carefully. Answer all relevant questions as accurately as you can. Please PRINT your written answers.

Completion of this questionnaire is completely voluntary. Completion and submission of this questionnaire implies your consent to participation in this research project.

1. Over the past six (6) months, which of the following libraries did you use?

University of Wollongong ☐
Other University ☐
Wollongong City ☐
Wollongong Hospital ☐
Port Kembla Hospital ☐
School ☐
Other public library ☐
State Library/Mitchell Library ☐
TAFE ☐
Other: (provide details below) ☐

2. In order to locate the eighth edition of *Textbook of medical physiology* by Arthur C. Guyton and published by Saunders of Philadelphia in 1991 using the University of Wollongong Library catalogue, which ONE of the following commands would you use?

A>AUTHOR ☐
T>TITLE ☐
B>AUTHOR/TITLE ☐
S>SUBJECT ☐
W>WORDS in titles, subjects and contents ☐
C>CALL NO. ☐
I>ISN ☐
L>LIBRARY INFORMATION ☐
R>RESERVE COLLECTION ☐
V>VIEW your circulation record ☐
F>DISCONNECT ☐

3. In order to locate this book, what specific words would you type in once you had selected the appropriate command?

4. If you knew nothing at all about the assessment of vital signs as it relates to health care workers such as nurses, which ONE of the following sources of information would you consult first?

Journal article ☐
General dictionary ☐
Medical dictionary ☐
Nursing textbook ☐
Other (provide details) ☐

Other: ....

5. If you were asked to locate a current journal article on the assessment of vital signs, where would you probably start your search for information? (Tick only one response.)

No idea ☐
Browsing through nursing journals ☐
Go to Information Desk ☐
Speak to Research Librarian ☐
Look in Folios (second floor) ☐
Look in Reserve Collection ☐
Use catalogue to get a list of journals ☐
Using a CD ROM database (eg. CINAHL) ☐
Use (J>) journal command on Library catalogue ☐
Use (W>) word command on Library catalogue ☐
Use (S>) subject command on Library catalogue ☐
Use (T>) title command on Library catalogue ☐
Use (SE>) serials command on Library catalogue ☐
Use bibliography from a textbook ☐

6. Describe how you would go about locating an article, held in the University of Wollongong Library, by A. Jolly titled "Taking blood pressure" which was published on pages 40 to 43 of the 15th issue of the 87th volume of the journal *Nursing times* in 1991.

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7. Please indicate your level of confidence in undertaking each of the listed skills by ticking in the relevant box.

Skill	**Very Confident**	**Confident**	**Somewhat Confident**	**Little Confidence**	**No Confidence Whatsoever**
Accurately identify key words in an assignment question					
Select appropriate					

subject/specific dictionaries and thesauri to define search terms					
Expand from a key word to create a list of broader and/or narrower terms					
Expand from a key word to create a list of synonyms and/or related terms					
Use the above skills to produce a comprehensive search strategy for an assignment					

7 This question relates to the use of electronic databases such as *Cinahl* or *Apais*. Please indicate your level of confidence in undertaking each of the listed skills by ticking in the relevant box.

Skill	Very Confident	Confident	Somewhat Confident	Little Confidence	No Confidence Whatsoever
Choosing a suitable database					
Constructing a search strategy by defining terms and key words					
Combining searches, e.g. AND/OR/ NOT					
Refining a search by broadening or limiting or using truncation, etc.					
Using features of a database such as limit fields, thesaurus, year of publication, language of publication, etc.					
Selecting and downloading or printing an appropriate set of references/sources					

9 Do you have any comments about your experiences with Library searching?

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INFORMATION AND INFORMATION TECHNOLOGY USE IN UNDERGRADUATE LEGAL EDUCATION

Natalie Cuffe and _Christine Bruce_
Queensland University of Technology

Abstract *This paper outlines research undertaken for a Master of Information Technology (Research) at Queensland University of Technology (QUT). Despite the growing emphasis on information skills training, research into this area of legal education in Australia has been scant. The aim of the research described in this paper was to examine the extent of law students' use of information and information technology in undergraduate legal education, their success rate with using information and information technology, and their views on the place of information literacy education. We also wished to determine implications for law school curricula in Australia. The primary outcome of the research undertaken is a picture of law students' present experiences with information and information technology hitherto unavailable to legal educators In particular the results of the survey show that, despite the rich information and information technology environment surrounding law students and existing skills training, present legal curriculum does not seem to have succeeded in the task of educating students for effective information problem solving that is critical in legal practice. This paper presents some key results of the survey and points towards an alternative curriculum model which may strengthen education for lifelong learning and information literacy in legal curriculum.*

Introduction

Information literacy is increasingly becoming well established as an important educational outcome for university graduates of all disciplines, both by universities and employers. The 1997 Goldsworthy Report *The global information economy: the way ahead* recommended in the area of enhancing skills formation, education and training that 'all tertiary graduates should be information and communication technology literate in their chosen fields of study and expertise by the year 2000'.[1] This is being taken up by universities in their statements about graduate attributes which invariably refer to lifelong learning capabilities, information literacy or both of these. The significance of incorporating legal research skills training in law curriculum has been acknowledged since the Pearce Report, a discipline assessment of Australian law schools in 1987.[2] Despite the growing emphasis on information skills training, research into this area of legal education in Australia has been scant. The aim of the research described in this paper was to examine the extent of law students' use of information and information technology in undergraduate legal education, their success rate with using information and information technology, and their views on the place of information literacy education. We also wished to determine implications for law school curricula in Australia.

The primary outcome of the research is a picture of law students' present experiences with information and information technology hitherto unavailable to legal educators. In particular the results of the survey show that, despite the rich information and information technology environment surrounding law students and existing skills training, present legal curriculum does not seem to have succeeded in the task of educating students for effective information problem solving that is critical in legal practice. The remainder of this paper presents some key results of the survey and points towards an alternative curriculum model which may strengthen education for lifelong learning and information literacy in legal curriculum.

Literature review

The debate regarding the appropriate aims and objectives for the provision of legal education in contemporary Australian society has been an ongoing one and the subject of substantial reports in recent years.[3 4]

The Pearce Report was a discipline assessment of Australian law schools for the Commonwealth Tertiary Education Commission.[5] It is considered to be the seminal work in Australia in recent times on legal education including curriculum development, library facilities, assessment and teaching practices, staff selection and development, and resource allocation (including technology) amongst many other issues. The report provides an individual analysis of law schools around Australia and makes individual and collective recommendations.

A notable theme in the Pearce Report is the importance of the role of the law school in the training of law students for the legal profession and for the many other careers that involve legal work. Pearce indicates that law schools cannot realistically teach all areas of law and that they quite rightly seek to achieve other aims in education than the mere imparting of knowledge. These are primarily the cultivation of intellectual skills and evaluative understanding. However, as Pearce states, 'it is also appropriate for [law schools] to be concerned to some extent with the cultivation of *skills* of a kind which lawyers use and which *enable them to cope with change*' [emphasis added].[6] Conceivably the skill of use of legal information and information technology in a changing information society is an appropriate aim of legal education. This is supported by the statement that 'the teaching of skills....should not be pilloried as some form of technical training unsuitable for legal training'.[7] However the Pearce Report does not substantively address the issue of information and technology skills in its examination of law school curricula. The report only briefly discusses the narrower concepts of legal research, computer skills and the importance of reader education because 'one of the major skills a law student needs to acquire is the ability to independently undertake legal research into the materials both primary and secondary'.[8]

The McInnis Report in 1994 was a review of the implementation of the recommendations from the Pearce Report. Interestingly in the discussion of the development of skills teaching since 1987 no substantial treatment is given to information technology and the issue is mentioned in passing in comments such as the importance of the 'relationship between university legal education and social and technological change'.[9]

The importance of undergraduate education as a link in the lifelong learning process in an information society was a significant theme in the Candy Report investigation into higher education.[10] A vital finding of the Candy Report was that 'access to, and critical use of information and information technology is absolutely vital to lifelong learning, and accordingly no graduate – indeed no person – can be judged educated unless he or she is 'information literate' and, to an extent, computer literate as well'.[11]

The development of information literacy education in institutions of higher education has been influenced predominantly by librarians in their delivery of library instruction, bibliographic instruction and user/reader education.[12] The analogy that the law library is to lawyers what the laboratory is to the scientist and the museum is to the naturalist is one that has been used for decades to describe the pivotal role the law library plays in the life of lawyers and law students.[13] As Woxland states '..legal research skills are essential because the law library remains today, as it was one hundred years ago, at the heart of legal practice...there is something unique about the relationship of law books and the law library to the practice of law..'.[14] In the United States and the United Kingdom the consideration of law library instruction, legal research and information technology are evident in the literature.[15-22] Wren and Wren provide one of the foremost discussions on the importance of a process orientated approach, to teach law students *how* to do legal research, rather than teaching the contents of books or legal bibliography. 'Future lawyers need a sound understanding of the problem-solving process of legal research, and need a familiarity with law books only to the extent it advances that understanding'.[23] This type of discussion is a step towards developing information literacy models for law school curricula. In Australia the literature on law library instruction and legal research has tended to be a description of the content of legal research courses or a survey of what law schools are teaching legal research, the problems/issues and where in the curriculum it is being taught.[24-26] It is acknowledged in the Australian literature that legal research courses in Australia law schools are no longer in their infancy, but have at best developed to adolescence and still need to grow and that there is no clearly accepted model for such courses.[27-29] This research seeks to develop such a model using the conceptual framework of information literacy.

Designing and conducting the survey

As we were seeking quantitative data on characteristics, behaviours and beliefs relating to information and information technology use by law students, survey research seemed most appropriate.[30] A survey researcher asks people questions in a written questionnaire (mail out or hand out) or during an interview, then records the answers.[31] Surveys are often used in descriptive or explanatory research. The basic purpose of the descriptive survey is to describe characteristics of the population being studied, make specific predictions and 'test' relationships.[32]

The descriptive survey questionnaire technique was the most appropriate in this study for the following reasons

- it would be cost effective and practical to administer[33]
- it would provide hard quantitative data that would be relatively easy to collect and analyse
- a hand delivered questionnaire results in a negligible response rate problem[34]
- it would allow for a significantly sized and representative sample which would improve the reliability of the conclusions to be made about the entire population under study – general rule of thumb is the larger the sample the better[35]
- questionnaires tend to encourage frank answers largely because it is easier for the researcher to guarantee anonymity.[36]

The population of law students at the three law schools in Brisbane, Queensland University of Technology, University of Queensland and Griffith University is approximately 4500. As a population group they are relatively homogenous and a smaller sample is appropriate in these circumstances.[37, 38] Final year law students were used as the sample because as the group exiting the legal education process they are in the best position to reflect on legal education and are also most likely to be at the highest level of skills development. In Semester 1 1999, when the survey was administered, the final year student groups at each institution numbered approximately 600: Griffith University (approximately 80), University of Queensland (approximately 220) and QUT (approximately 300).

The questionnaire instrument comprised of four sections that used a 'tick a box' question format, and a matrix or grid question to present in a compact way a series of questions using the same response categories. The final page of the questionnaire contained an 'Any other comments' space and a terminology guide. The first section sought information on *Demographic* details such as gender, age group, status as a part time or full time student, whether law is first degree and GPA. The second section, *Extent of use of information and information technology*, asked questions about the nature of students' access to a range of information technology and the frequency with which the information technology is used, frequency of visits to the law library, the nature of legal research training received at law school and their perceptions of that training. The third section, *Nature of use of information and information technology*, asked questions about the level of experience in completing a range of information and information technology tasks, such as whether you are always successful in downloading a file from the World Wide Web, and the nature of respondent's attitudes to information literacy. The fourth section of the questionnaire comprised a test to verify answers to questions in the earlier sections of the questionnaire. This *Research problem* focused on common legal research tasks for Australian law and was designed to test particularly the answers in the *Nature* section of the survey where respondents were asked about the success of their experiences in a range of information and information technology activities.

The questionnaire was piloted in Semester 2, 1998 and administered in full to final year law students at Queensland University of Technology, University of Queensland and Griffith University in Semester 1 1999.

The statistical analysis software used for data input, management and analysis was SPSS (Statistical Package for Social Sciences).

Key results from the survey

What can we say about the experiences of final year students in three Queensland metropolitan universities? The survey provides a detailed picture of the student population as being frequent users of information and information technology, as having ample access to the necessary technologies, as considering themselves to be successful users, but as being apparently unable to transfer their supposed skills to relatively simple legal research problems. This inability raises questions about students actual, as opposed to perceived, levels of success in their use of information and information technology for legal problem solving.

The typical respondent

A total of 226 response were received from the three universities surveyed. The percentage breakdown of responses by university was 39.8 per cent University of Queensland, 31 per cent Griffith University and 29.2 per cent Queensland University of Technology.

The respondents reflect a common statistic of a greater number of females in law schools than males. 55.8 per cent of respondents were female and 43.8 per cent were male.

The majority of respondents were in their twenties, with 82.7 per cent aged between 20 to 25 years and 10.6 per cent aged 26-30 years. Enrolment as a full time student was most prevalent with 89.8 per cent of respondents indicating they were full time students, with 10.2 per cent studying part time.

The results of the question on whether the LLB was the respondents first degree indicates that for only 53.1 per cent of respondents the LLB is their first degree. It is interesting that with the most represented age group being the 20 to 25 group that so many respondents would have another degree. Perhaps it is reflective of the increase in recent years in double degree combinations at law schools.

The final question in the *Demographics* section asked respondents to indicate what range their Grade Point Average (GPA) was in. 50.9 per cent indicated that their GPA was in the range of 5.1 – 6, with 27.4 per cent indicating the 4.1 – 5 range.

Thus, if there is a typical respondent it is a full time female student, aged between 20 and 25 with a GPA between 5.1 and 6 for whom the LLB is their first degree.

Extent of use of information and information technology

Information and information technology use amongst the final year law students in Brisbane who responded to the questionnaire is quite extensive. Students surveyed report a high level of access to information and information technology and they use the resources frequently.

Approximately 75 per cent of the final year law students in Brisbane visit the law library almost daily or once a week. This response reflects the special relationship between law students and law libraries. The analogy that the law library is to lawyers what the laboratory is to the scientist and the museum is to the naturalist is one that has been used for decades to describe the pivotal role the law library plays in the life of lawyers and law students.[39]

Almost all students have computer access, including a word processor, at home, with roughly 60 per cent also having World Wide Web and email access from home. Interestingly only 77 per cent are aware that computer access is available to them at university. Table 1 summarises the nature of access to information technology that final year law students in the three Brisbane universities indicate is available to them.

Table 1 – Nature of access to information technology

	Home	**University**	**Work**	**No access**
Computer	91.6%	77%	29.6%	.4%
World Wide Web	59.3%	85.8%	22.1%	1.3%
Email	60.2%	74.8%	22.1%	3.1%
Word processor	89.8%	65.9%	25.2%	.4%
CDRom	54.4%	77.9%	18.6%	3.5%

The frequency of use of information technology amongst respondents is also significant. Approximately 70 per cent use a computer daily with roughly 50 per cent using the World Wide Web, email and word processors each daily, and approximately 30 per cent use CDRoms weekly. Table 2 outlines the frequency of use of information technology of final year law students in the three Brisbane universities in 1999.

Table 2 – Frequency of use of information technology

	Daily	Weekly	Monthly	Occasionally	Never	No answer
Computer	72.1%	22.1%	1.3%	1.8%	.9%	1.8%
World Wide Web	42.9%	39.8%	6.6%	7.1%	2.2%	1.3%
Email	52.2%	31%	4%	4%	7.1%	1.8%
Word processor	56.2%	28.3%	8%	3.5%	1.8%	2.2%
CDRom	11.1%	29.6%	20.8%	27.9%	6.2%	4.4%

Success rates with using information and information technology

Respondents were asked to rate their level of success in a range of information and information technology activities that focused on common legal research tasks for Australian law. Table 3 outlines the results for each of the activities. The results for the two ends of the response spectrum of 'Always successful' and 'Not used' are particularly interesting in painting a picture of the way in which the students approach law related information and information technology activities.

Table 3 – Success rates with using information and information technology

TASK - SUCCESS	Always successful	Usually successful	Seldom successful	Not used	No answer
Using a word processor to complete an assignment	84.5%	12.4%		.9%	2.2%
Downloading a file from the World Wide Web	27%	54%	9.3%	7.5%	2.2%
Using email to communicate with lecturers and students	51.3%	29.2%	3.1%	13.7%	2.7%
Using legislation annotations to find reprints of legislation	27.4%	40.7%	8.4%	20.8%	2.7%
Using AustLII to find unreported cases	20.4%	52.2%	10.2%	14.6%	2.7%
Using case citators to find case citations	24.3%	46.5%	8%	17.7%	3.5%
Using the library catalogue to find a book on a topic	46.5%	44.7%	3.5%	2.2%	3.1%
Evaluating whether legal information found is current	14.6%	59.3%	11.1%	11.1%	4%
Finding second reading speeches in Hansard	8.4%	24.8%	10.2%	53.5%	3.1%
Listing keywords about your research problem	23.9%	59.3%	4%	8.4%	4.4%
Finding out whether Australia is a party to a treaty	7.5%	17.7%	6.6%	65%	3.1%
Searching full text CDRom databases of cases	23.5%	38.9%	11.5%	22.6%	3.5%

Overall the respondent final year law students rated their law library skills as slightly better than their computer and IT skills, with 65.9 per cent rating their law library skills as 'Excellent' (15 per cent) or 'Good' (50.9 per cent) in comparison to 65 per cent rating their computer and IT skills as 'Excellent' (19 per cent) or 'Good' (46 per cent). Graphs 1 and 2 graphically display these results.

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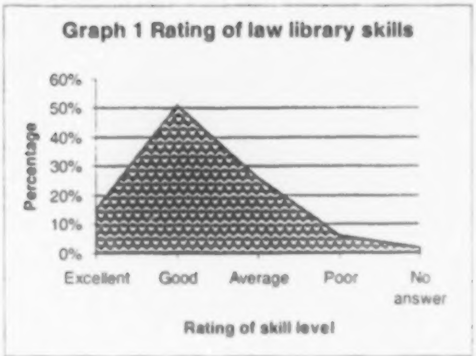
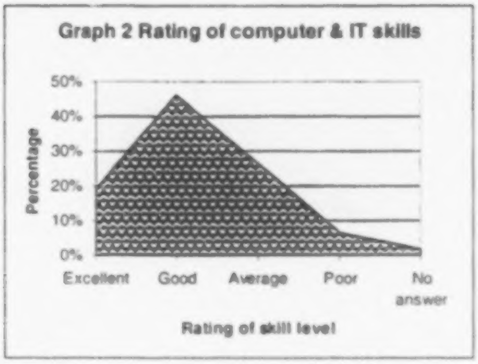


Graph 1 Rating of law library skills



Graph 2 Rating of computer & IT skills

Analysis of research problem

The *Research problem* section of the questionnaire focused on common legal research task for Australian law and was included to test or verify particularly the answers in the *Nature of use of information and information technology* section where respondents were asked about the success of their experiences in a range of information and information technology activities. The respondents were presented with a brief and simple research problem and asked to answer a series of questions relating to the problem. The answers to the research problem were evaluated alone and then cross tabulated with the respondent's ranking of the success of their experiences. A few examples of the cross tabulations are included below together with the basic analysis of the answers to the research problem.

The first question about the research problem asked respondents to indicate the keywords they would use to start researching the answer to the problem. Of the four choices, 76.5 per cent selected the most appropriate combination of keywords. The cross tabulation below of the answers to the keywords for the research problem correlated with the respondents rankings of their experiences in listing keywords shows that 79.6 per cent of respondents who indicated they were always successful in listing keywords selected the most appropriate combination of keywords ('contract and breach and Queensland') for the research problem presented (43 of 54).

Listing keywords experience/keywords to research problem cross tabulation

			Keywords to research				Total
			damages	contract and breach and Queensland	contract law	No answer	
Listing keywords experience	Always successful	Count %	6 11.1	43 79.6	4 7.4	1 1.9	54 100.0
	Usually successful	Count %	1 8.2	10 77.6	1 11.2	4 3.0	13 100.0
	Seldom successful	Count %		6 66.7	2 22.2	1 11.1	9 100.0
	Not used	Count %	2 10.5	1 78.9	1 5.3	1 5.3	1 100
	No answer	Count %	1 11.1	4 44.4		4 44.4	9 100.0
	Don't know	Count %		1 100.0			1 100.0
Total		Count %	20 8.8	17 76.5	22 9.7	1 4.9	226 100.0

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Another interesting result from the research problem was the last question that asked students to indicate the best process for locating up to date Queensland legislation. The options combined annotations, current awareness services, full text hard copy reprints and the OQPC web site with electronic reprints in a variety of ways and specific orders. Only 44.2 per cent of respondents selected the most appropriate answer (*Queensland legislation annotations*, *Queensland legislation update*, OQPC web site) with 31 per cent selecting the next most appropriate answer (*Queensland legislation annotations*, *Queensland legislation update*, *Queensland legislation reprints*). The cross tabulations of World Wide Web downloading experience, *Queensland legislation annotations* experience and *Evaluating legal information currency* experience with the responses to the *Best process for locating up to date Queensland legislation*, show a low level of correlation between those respondents who indicated they were always successful at those tasks with the selection of the most appropriate answer for the research problem. For example, in the World Wide Web cross tabulation, below, only 45.9 per cent of those students who indicated they were always successful in downloading from the World Wide Web selected the most appropriate process for locating up to date Queensland legislation *which includes a component of downloading from the Web.*

World Wide Web downloading experience/Best process for locating up to date Queensland legislation cross tabulation

			Best process for locating up to date Queensland legislation						
			Federal Statute Annotations, Aust Current Law Leg, Qld reprint	Qld Leg Annotation, Qld Leg Update, OQPC site	Qld Legal Indexes, Aust Legal Monthly Digests, Qld reprints	Qld Leg Annotations, Qld leg update, Qld reprints	No answer	Don't know	Total
World Wide Web downloading experience	Always successful	Count %	2 3.3	28 45.9	4 6.6	13 21.3	13 21.3	1 1.6	61 100.0
	Usually successful	Count %	2 1.6	57 46.7	10 8.2	42 34.4	10 8.2	1 0.8	122 100.0
	Seldom successful	Count %	1 4.8	9 42.9	1 4.8	7 33.3	3 14.3		21 100.0
	Not used	Count %	1 5.9	5 29.4	1 5.9	7 41.2	3 17.6		17 100.0
	No answer	Count %		1 20.0		1 20.1	3 60.0		5 100.0
Total		Count %	6 2.7	100 44.2	16 7.1	70 31.0	32 14.2	2 0.9	226 100.0

In brief, similar patterns to the above emerged with the responses to the other questions in the research problem, which asked respondents

- to rank four research tools in the order in which they would use them to research the answer to the problem – the responses were (1)textbook (2)looseleaf (3) Internet (4) journal articles
- what is the best Australian legal journal index – only 57.5 per cent selected *AGIS*
- what resource to use to determine if legislation has been amended – 71.7 per cent selected legislation annotations
- what is the URL for AustLII – only 69.9 per cent selected the correct URL.

Nature of legal research training received

The questionnaire enquired of respondents whether they had received legal research training at law school and the nature of that training. For example, whether the training was compulsory, when it was received, the nature of the content of the training and the type of trainer.

The results indicate that 94.7 per cent of the respondent final year law students received legal research training at law school. This figure reflects the increase in legal research training offered in law schools in the 1990s after the 1987 Pearce Report criticism of the lack of such training in law school curriculum.

Almost 95 per cent of respondents indicated that the legal research training they had received at law school had been of a compulsory nature.

Table 4 outlines the years of their law degrees that the respondents received legal research training. 96.7 per cent of respondents received training in the first year of their degree.

Table 4 - Years legal research training received

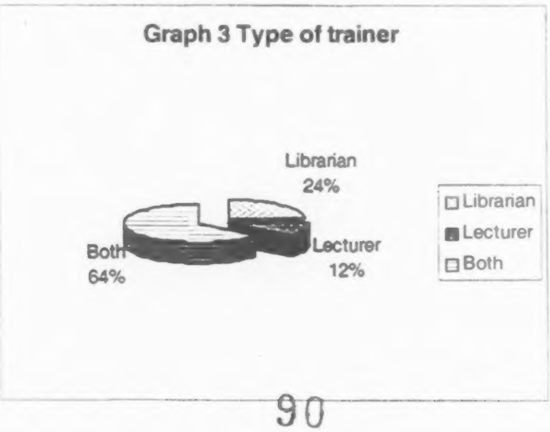
	Year 1	Year 2	Year 3	Year 4	Year 5
Yes	96.7%	9.8%	5.1%	5.1%	10.3%

Analysing the results on the content of the training collectively, over 70 per cent of respondents indicated that they had received training in the areas of researching case law and legislation, using CDRoms, legal reasoning and writing, legal citation, researching secondary sources, using the library catalogue and a law library tour. This array of training areas accords with the range of areas reported in the literature to be covered in legal research and writing courses in the 1990s, particularly the early to mid 1990s when the phenomena of legal research subjects in law schools was truly taking off.[40] Collectively, less than 40 per cent of respondents received training in using the Internet, researching international law and researching law from overseas jurisdictions. Table 5 displays the breakdown of responses by category.

Table 5 - Nature of content of legal research training received

Content	Percent received training in content area
Law library tour	87.9%
How to use library catalogue	80.8%
Researching case law	93.5%
Researching legislation	92.1%
How to use CDRoms	71%
How to use the Internet	39.3%
Researching international law	14.5%
Researching law from overseas jurisdictions eg US, UK	22.9%
Legal reasoning and writing, legal citation	76.6%
Researching secondary sources eg journal articles	72.9%

63.6 per cent of respondents indicate that they received legal research training by both librarians and lecturers. Graph 3 outlines the break down of the types of trainer who offered the respondents legal research training. In a 1991 survey it was found that law library staff were involved in legal research subjects at either a teaching or consultancy level, whilst the subjects were mainly coordinated by law academic staff .[41]


Graph 3 Type of trainer

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Perceptions of legal research training and skills

Various sections of the questionnaire canvassed respondent's perceptions of legal research training and skills, such as their preferred position for legal research training in the curriculum, whether the training should be compulsory or optional and pass/fail or graded, the teaching and assessment methods that assist respondents in learning legal research and the perceived importance of legal research and information technology skills to the study of law and legal practice. Table 6 depicts respondent's preferred position for legal research and information technology training within law curriculum. Just over 50 per cent of respondents supported the approach of a separate first year legal research subject. This is currently the most common position for this type of training in law curriculum. In the early 1990s it was also common for legal research training to be incorporated as a component of another compulsory first year subject.[42] It is interesting to note the questionnaire result that there is less student support for such a model, with only 26.2 per cent of respondents preferring training to be integrated within another first year subject. An optimistic explanation for this would be that students appreciate the necessity for such training and that it is sufficiently important to warrant a separate first year subject. A 1992 survey of Brisbane solicitors showed that the solicitors rated legal research training they had received in a compulsory first year setting as less useful than training at the vocational or professional stages, or very late in the law degree. Voluntary training at law school was judged least useful.[43] 34.1 per cent of respondents to this survey support the ongoing learning of legal research throughout the degree with training integrated within one subject in each year of the law degree. This ongoing learning process is also supported by comments from respondents from all three universities, such as training should be

- *in all subjects*
- *maybe as part of moots and assignments*
- *all subjects require legal research and information technology skills*
- *also in 3rd and 5th year*
- *integrated in years 1,2 and 3 (progressive)*
- *continuous – lesson for each subject*
- *more continuous training and updates would be useful as you progress through the degree.... different subject areas involves the use of different resources*

Table 6 - Preferred position for legal research and information technology training within law curriculum

Position in curriculum	Percentage preferring this position
Separate first year subject	50.5%
As an elective	4.7%
Integrated within one subject in each year of the law degree	34.1%
Integrated within another first year subject	26.2%
Separate final year subject	12.6%

Respondents have a strong preference for compulsory legal research and information technology training in law school, with 93 per cent preferring the training to have a compulsory status. Earlier this decade many legal research subjects or training was reported as optional.[44]

The survey results also indicate that

- 71 per cent of respondents favour legal research and information technology training being assessed on a pass/fail basis, rather than being graded
- students respond to hands on (73.4 per cent), demonstrations (57 per cent) and small group tutorials (59.8 per cent) as teaching methods that assist them in learning legal research. Less support is evident for lectures (30.8 per cent) and web based teaching materials and exercises (29.9 per cent) as teaching techniques
- students prefer assessment methods such as library exercises (50.5 per cent) and essays requiring a structured research methodology (43 per cent) rather than short answer exams (26.2 per cent) and multiple choice exams (11.2 per cent)

- 96.9 per cent of final year law students felt that legal research and information technology skills were either very (81.9 per cent) or moderately (15 per cent) important to the practice of law. In comparison, 95.6 per cent felt that these skills were very (78.8 per cent) or moderately (16.8) important to the study of law. One person felt that they were not important to the study of law at all.

Implications for legal education

The survey results show that the following scenario prevails in contemporary legal education

- students use information and information technology heavily and have considerable access to the necessary resources
- students claim to be using information and information technology heavily, but they do not appear to be using these resources as effectively as they should be used
- students are apparently unable to transfer skills they perceive themselves as having to novel situations
- Information skills instruction is presently largely confined to first year and is not integrated into the teaching learning experiences of subjects other than legal research
- students would like to have better integrated and further instruction within their courses.

These findings suggest that the present curriculum model for legal education has several drawbacks in relation to contemporary directions recommended for information literacy education. The present model (see Figure 1) largely isolates information skills instruction within the legal research program. This effectively separates it from the broader legal curriculum (this separation is symbolised by the use of a solid black line around information and information technology skills in Figure 1). Legal research courses assume a level of information and information technology skills that is not reflected across the range of varying levels of skills and experiences of students. It appears that students needs remain largely unaccommodated by legal research courses, which may be said to concentrate on bibliographic instruction rather than legal information literacy.

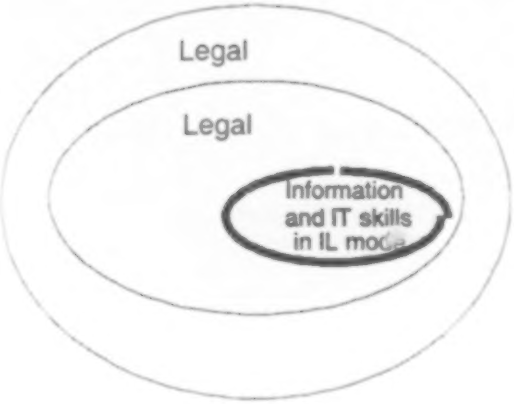
Further, legal research courses do not influence or shape legal curriculum to the extent that they could. So, although they are considered core to the curriculum, they remain somewhat isolated, a factor represented by the black line separating legal research from legal curriculum in Figure 1.

Modifying the situation that has emerged from this survey to make it consonant with what is considered to be best practice, [45] suggests the need for a new model of legal education. In this new model (see Figure 2) graduate attributes are central and legal curriculum shapes these attributes. In this new curriculum all aspects of the curriculum inform each other. Curriculum is designed according to principles of lifelong learning and information literacy education.

On this basis we recommend

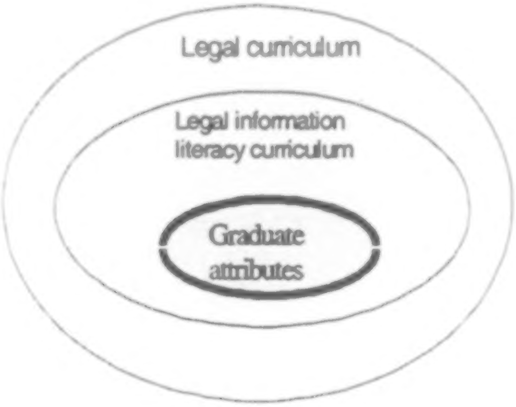
- the development of general principles for information and information technology use in undergraduate legal education that encourage these as lifelong learning skills
- the identification of a set of relevant information and information technology skills for contemporary legal education
- the development of a conceptual framework/model for the application of information literacy principles to legal research courses in law school curriculum.

Figure 1: ***PRESENT***


Legal
Legal
Information
and IT skills
in IL mode

Information and information technology skills in an information literacy mode in present legal research courses sit mostly in isolation. Elements of information literacy are taught within legal research courses, but not in an integrated or influencing manner, hence the heavy black.

Figure 2: ***FUTURE***


Legal curriculum
Legal information
literacy curriculum
Graduate
attributes

Current trends in higher education suggest this type of model.

Legal research is core to a process driven curriculum and is subsumed within the content that is the essence of the core legal curriculum.

Graduate attributes are being informed by legal information literacy and vice versa. There are no barriers, the interaction is fluid, hence no black line.

Collectively graduate attributes and legal information literacy inform and are infused within legal curriculum.

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INFORMATION LITERACY LESSONS FROM *EDNA ONLINE*

Jillian Dellit
Education.Au

Abstract '*The NRA's [National Rifle Association's] slogan [Guns don't kill people. People kill people] is a telling example of what we might call the myth of neutral technology, the idea that artifacts are not political because they can't do anything on their own. It is a presumption whose folly is matched only by its opposite: the notion that political outcomes can be determined solely by a technology. A more fruitful way to think about technology's impact is that it depends on a combination of design, use, and the environment in which it is deployed.' Thus Shapiro's*[1] *categories of 'design, use and the environment in which is it deployed' are useful ones in which to consider information literacy as one of the impacts of technology. Indeed, traditional literacy is built by a similar concentration on the construction and use of language and the environment in which language is deployed. This paper therefore uses those three categories to examine information literacy and uses some of the insights gleaned from Education Network Australia (EdNA) to illustrate the transformations involved.*

Information literacy is inseparable from the uses and impact of information and communications technology. In the 1970s and 1980s librarians struggled to interest educators in information technology. Educational interest is now awakened ironically at a time when a political agenda highly related to 'basics' – inevitably more tied to the past than the future – dominates in the public arena. This presents some challenges to educators. Notions of lifelong learning, learning technologies and learning organisations demand highly sophisticated skills for individuals and organisations. In the absence of widespread public demand and debate, we run the risk that information literacy will not form the basis of public education and of civic requirement, but be limited to consumer demand.

Certainly, consumer demand is there. *EdNA Online* has grown in the public domain over the last two years since its launch and has built a strong user base. We have learned quite a lot about information literacy from our experience. This paper outlines some of those areas of learning. The greatest challenge, however, lies in how to embed information literacies into mainstream education in a way that preserves the continuity of universal, culturally constructive education.

Information creation

The capacity of Internet users to create information renders information creation integral to information literacy. The distinction between information use and information creation blurs. Users of the Internet leave footprints behind them which in turn become part of the content available to others. Some of this is intentional.

> …the Net not only allows us to dissect and criticize what is published, it lets us become publishers ourselves. We can do spin on the news or we can create the news. Even more than holding journalists accountable, this is the real way that Net users will shake the foundations of the fourth estate and the culture business writ large. With the ease and appeal of interactive media, we will increasingly become producers of information rather than just consumers of it[2]

What Net users leave behind can also be unintentional. Cookies transfer information about our choices to sites we have visited. Our own computer caches, our server's memory, our Internet service provider's hardware, all record traces of our journey in cyberspace. Information literacy, therefore, needs to include awareness of and capacity to control what is created.

EdNA Online began as a directory service. We thought we could just point to sites – a useful service and clearly an information service. We had reckoned, however, without the nature of the medium. Users wanted to ask questions – to tell us how they used the resources, to ask for other resources. They wanted to talk to other users of the information and then to archive their discussions. They made inquiries and we soon realised these inquiries were useful to others. In short, our users naturally moved to being creators of information as well as users, and we realised the value of trying to capture the experience of our users. We set up a *What's new* service to publish information about new resources on the EdNA site. Our users told us that remembering to go to the site every week to check on what was new was a drag. We set up email lists to send them the information every week. They told us it would be great if they had some idea of the kinds of resources that would be coming up, so they could plan to use them. We developed a calendar that provided a planning framework for the information. Our users had become creators of information, were shaping the service. This is the nature of the Internet – people can have their say and can shape the information they find.

What skills are our users demonstrating? They are clear, analytical and articulate about their needs. They are experimental. They admit to success and failure and expect us to do the same. They have some idea of the capability of the technology, expect us to push its boundaries and accept that it will sometimes let us down.

What skills do we need? We have to listen carefully. We have to control our defensive reactions and to think creatively 'off the square'. We have to be prepared to try things we had not thought of, to abandon or change things we offer, to identify the gaps in our knowledge and to seek advice from any source that might have expertise we need.

There are some specific areas of information creation that frequently arise in the operation of *EdNA Online*.

Multimedia

In previous decades all students learned how to write in linear sequence as a part of literacy training. Information literacy in the twenty first century demands an understanding of design – of visual and audio cues – a multimedia literacy.

> But our theories and teaching of literacy have long been too logocentric. While children are learning to distinguish different semiotic resources (eg drawing from writing), thus opening up larger combinatorial spaces for using the in coordinated ways, we are only teaching them to use one: written language. When we do teach other modes, such as singing, drawing, or mime, we still do not teach students about the traditions and possibilities for combining these with writing and with each other. That needs to change very quickly and very thoroughly, if we are to help students develop sophisticated multimedia literacies. Their new authoring skills will hopefully enable students to create multimedia portfolios (cf Kieffer et al., this volume) will help teachers remove the logocentric bias from our evaluations of their understanding and competence, as well as enable them to produce the kinds of meanings they really want to mean[3]

It is insufficient for a student to be able to access Internet published information. A student will need to communicate through the new traditions of the Internet – through commentary, hyperlinking and employing a full range of media. The imagery at the disposal of the literate student is now more than verbal imagery.

> These advanced and powerful capabilities that are increasingly available to our students beg for a different kind of assignment. Writing a report about something has as its goal the demonstration of gained knowledge. Yet gaining knowledge becomes only a small part of what students should be learning to prepare them for a world where knowledge changes and information grows at dizzying speeds. In fact, in the information world, their jobs will be to help in growing knowledge by becoming information builders.[4]

Transformation

The transformation of information into knowledge is a key part of information literacy. It is more integral than the same process in traditional literacy because the media available to the student render reproduction redundant. The student does not need to reproduce information. We must therefore rethink the tasks we set for students and the expectations we have of them. The technology itself can reproduce infinitely – removing the need for the student to reproduce and enabling the student to act immediately as transformer.

Technological problem solving mostly involves adaptation and modification, building on, rather than constructing from scratch.[5] This technological reality is not reflected in much of what we expect students to do. We thus limit our students by our preconceived notions of how technological processes operate.

A large part of *EdNA Online* comes from the value our users, and we, can add to base level information. We add metadata, for example, to existing resources, in order to ensure they will be found in appropriate contexts. We link one resource to another in order to lead our users to points of connection. We collect resources around an event (such as World Environment Day) creating a service from what already exists in a different form. We tell a story that casts information in a new light. The discussion that a group of teachers has about a resource is captured so it can become a resource to another group of teachers in another time or place. The capacity to function in this way – adding value as we progress – is a key information literacy.

Collaboration

It follows from this process of adaptation that a critical component of information creation will be collaboration. The processes of creation will rarely involve an individual acting alone. Multimedia requires multiple roles. Its creation is more like film making than it is like writing a novel. Even when working in one medium, the technological problem solving process is likely to require collaboration and cooperation. These are therefore information literacy skills. This is true whether it is an individual or an institutional communicator. It applies to university research as much as to assignments in a primary school.

> Innovation no longer depends solely on how firms, universities, and research institutes perform independently, but, increasingly, on how they cooperate. Firms' recognition of the usefulness of academic research for their innovative activity translates into business's increasing (although still low) share in the funding of university research.[6]
>
> Cross border co-authorship of scientific articles and co-invention of patents provide an indication of the level of internationalisation of scientific and technological activities. International cooperation in research is increasing in both scientific research (25 per cent of publications are the work of multinational teams) and technological research (9 per cent of patents are the result of international cooperative research).[7]

Within the EdNA networks we have learned much that reinforces this changing process of information creation as a basic literacy. We now have a clearer idea than we did two years ago about the issues and processes on which it is useful to collaborate. Standards, policies, resource sharing principles are all areas where collaboration has proved to be essential to the survival of both the network and the *EdNA Online* service. This is true of cross sectoral collaboration and collaboration within sectors. Agreements on these matters have had to be reached at a high level before there is trust and confidence to proceed. However, collaboration occurs at the technical level as well. Very few processes in the development of a major Internet site can be done from a single decision point. Writers, designers, code cutters and information managers all have a perspective that needs to be accommodated if the result is sustainable. The interactions between these parties require considerable experience, management and a critical interaction with the decisive group – the users. These interactions will be part of the daily lives of those who are information literate.

One of the capacities therefore, of the information literate person is the capacity to identify roles, the ability to understand where roles overlap, the flexibility to adopt different roles at different times and the understanding of when a new role needs to be created. A literate person will have some editing skills. He or she will also learn to recognise the need for an editor. An information literate person will have some skills in creating information visually as well as verbally, but will recognise points at which more specialised skills are needed and have the requisite skill to work with specialists.

Exponential growth

Looking at last year's interface is like looking at the essay you wrote a decade ago. Before something is published on the web – even given the speed of web publishing, the learning curve has moved on. Devices like frequently asked questions (FAQs) mean we do not have to ask the same questions others have asked. This capacity to learn quickly, using what others have done before and comparing what we have just created ourselves with what others are creating simultaneously means we do not simply progress in our learning in regular incremental steps.

Before the *EdNA Online* developers have put the technical specifications into place, we have already seen new features that will improve performance and begun to at least discuss their impact. As children grow in spurts so our information literacy grows. Not everything has to be learned by doing. We learn by exposure and can skip whole stages of experience by observing others and leveraging from their experience.
Those who are information literate will know how to maximise these growth spurts and how to push their learning at these times. The management of this nonlinear learning is likely to be a benchmark for good teaching and research is needed to inform this.

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The processes within the EdNA technical development networks have the potential to be used to identify and exploit these times of intellectual and technical growth. It is hard to match these rhythms to budget cycles. These are issues of learning organisations. The networked structures of EdNA allow for a dynamic that could support more organic growth but multiple loyalties need to be balanced, providing a braking mechanism. By its nature the networked world demands the skills of working organically (or cyborganically) so the information literate must be able to meet this demand.

Information use

Blurring of boundary between information access and communication
Another expression of the tension between information use and information creation is the difficulty in differentiating information access from information communication. Communications technologies are intertwined with information technologies. While a student may begin looking for information in a passive way, it will not be long before he or she is inexorably drawn into communicating. This could occur through making an email enquiry of an expert, or checking the source of information with its creator, or it may occur through joining a listserv, online discussion or chat group. It may be through the adding of value (contributing a site, for example, to *EdNA Online* for evaluation or contributing information about how you used the site in your classroom).

The use of email also creates the need for honed literacy skills. Email has the feel of an oral communication. It can be used as easily as a telephone for a simple message or inquiry, but unlike the simple phone inquiry, it is retained as a record – potentially even when the user believes it is erased. Email provides the opportunity for broad distribution yet because of its ease of operation and origin at the desk of an individual, the sender may approach an email message more like casual private conversation. An email message is a form of publication, so the literacy demanded is more than the capacity to construct a readable, understandable communication and to operate the software program. There are precedents for the application of the laws of libel and defamation to email messages.[8] Those members of the EdNA networks who communicate regularly about the administration of *EdNA Online* have learned new skills in diplomacy and clarity, how to use courtesy copy functions skilfully to build the networks and enhance cooperation, how to pause before hitting a 'send' button and how to take note of the distribution information at the top of emails received.

Copyright and intellectual property
Also related to the issue of the blurred boundaries between creation and access are issues of copyright and intellectual property. Educators tend to operate with assumptions of free distribution, reconstruction and reuse of materials and ideas. An information literate person needs to know to what extent they can retain control of their own communication, when and how it can and may be used by others and when accessing and using information infringes copyright or involves a transfer of intellectual property.

EdNA Online makes available a lot of information and communication. Much creation occurs within the online education community. There are 187 professional discussion groups hosted on *EdNA Online*. Thirty seven of these discussions are archived on the site. They provide a rich source of information for both users and researchers. Those who contribute to the discussions need to be sufficiently information literate to understand that their email comments are in the public domain and what this might imply.

During the last week of August 1999 for Education Month in Online Australia Year we ran an online forum on *EdNA Online*. Six hundred people registered. Discussions were managed and were both synchronous and asynchronous. Some users were experienced and used the opportunity to share professional knowledge. They needed skills in keeping a discussion flowing, eliciting useful responses, contributing their own knowledge without appearing either condescending or naive. We learn to do this as a social skill in face to face learning environments. In the online discussion environment it becomes more of a literacy skill because all the communication is focused on the print appearing on multiple screens.

Others contributors to the August forum were neophytes and used it to practise basic skills of utilising software to join in a discussion. They were learning how to construct a sentence on their own screens and time its sending to the discussion, how to make 'asides' to a mentor also in the discussion, and how to follow different threads of discussion. There were students as well as educators involved in the discussion. A couple of friends from a school treated one discussion a bit like an opportunity to send notes in class, constructing messages that would have resulted in censure from both teacher and peers in a face to face classroom and in severe embarrassment to themselves had they been registered in a permanent record. The moderator disallowed the comments using the opportunity to try to build the information literacy skills of the students. We need more of these opportunities to allow both teachers and students to develop these skills environment and to explore the convergence of speech, writing, thinking and technical manipulation that occurs online.

It is a natural progression for educators to move into the online environment. An education is of no use if it does not support ongoing learning. Online conferencing has great potential for educators to both access and create knowledge. We hope to be able to extend the online forum on *EdNA Online* next year to provide more opportunities for educators and students to practice these information and communications skills in a supportive.

Selection, discrimination, comprehension

The most obvious issue for users of online services once they are confident users of a browser is how to control the flow of information to their desktop, how to find the things which are relevant and how to control the overload. The skills of selection and evaluation are therefore very early skills needed by Internet users of any age. At *EdNA Online* the development of technologies to assist users in this selection process occupy a lot of our thinking. *EdNA Online* itself is founded on selection. We have a policy of including what is relevant and valuable to the education and training community – a selection policy rather than a rejection policy. However, even within our limited set of selected resources (9400 resources and a further 235 000 indexed from those) we need to provide the facility of more limited sets for the many groups that make up our community. We try to do this through the provision of tools, such as the integration of the search and browse interface. Application of such tools enhances user literacy by leading them through steps to clarify their quest. The steps are much the same as they would be in the off line environment, but the need to use them is greater. Your chance of finding appropriate resources by random browsing diminishes in proportion to the size of the collection.

The information literate person can identify her or his need, find appropriate gateways, select and apply appropriate filters and discriminate between the resources once found. *EdNA Online* is an Australian education gateway (we aim to be *the* Australian education gateway of first choice) and provides some means of tailored filtering. The user must ultimately discriminate between the resources found.

Authenticity and validation

EdNA Online provides a framework of authentication and validation by including only services and sites that have been endorsed or selected by education authorities or those authorised by them. Professional educators using criteria agreed choose the 9400 core sites by the whole education community. There would of course, be significant variation in interpretation of these criteria applied as they are in a distributed way. Our users provide a check by sending feedback. We provide a short cut for users. The final choice however of sites or services to be applied in the learning situation, is with the user and he or she must be able to make judgements about the appropriateness of one resource over another.

Disintermediation

> Disintermediation is the somewhat ungainly word that is used to describe this circumventing of middlemen. Generally, it is associated with the ability to engage in commerce directly without brokers, retailers, and distributors. But the concept can be usefully expanded to describe the way that technology allows individuals to bypass editors, educators, and other gatekeepers who stand between us and whatever it is we seek. The control revolution allows us to take power from these intermediaries and put it in our own hands.[9]

EdNA Online is an intermediary. It stands between the learner and the Internet. It therefore reduces a little the skill required to access relevant educational information. Rather than eliminating intermediaries, the electronic environment is giving us greater choice of intermediaries – is facilitating reintermediation. True, an individual can use the Internet to learn for themselves without traditional intermediaries. However, many familiar signposts are missing. Shapiro[10] quotes Umberto Eco

> *After years of practice, I can walk into a bookstore and understand its layout in a few seconds. I can glance at the spine of a book and make a good guess at its content from a number of signs. If I see the words Harvard University Press, I know it's probably not going to be a cheap romance. I go onto the Net and I don't have those skills.*

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To learn in a targeted way or towards a specified outcome however, requires skill. The online world offers significant alternatives to traditional intermediaries as well as the option of relatively unmediated learning. The skill of choosing an intermediary or of knowing when to do without one is part of the repertoire of the information literate much as the skill of knowing when you need an accountant or a lawyer has been a business skill. In the knowledge age the boundary between personal and professional skills also blurs.

Reputation management

An emerging information management area is that of reputation management [http://www.useit.com/alertbox/ (see the article dated September 5, 1999)]. This refers to processes that assist users to judge whether an authority, service provider or referee is reputable. *E-bay* on its auction site, for example, uses software that collects and makes public data about the selling and purchasing records of those who offer goods for sale or who bid for goods on their site. *Amazon.com* provides reviews of books and music that add to or detract from the reputation of the book or music (but unlike *E-bay*, tell you nothing about the reviewer's reputation). These are very useful tools to the purchaser who still, however, has to be sufficiently information literate to be able to apply them and interpret the results. In the online world the user has to be a judge of truth and must establish efficient means of assessing the reliability of sources.

We would like to collect and share more information about how our users are using online resources. This would be another tool for our users and would require us to further develop reputation management tools.

Within the EdNA networks, educators do not, on the whole, display fears about capacity to discriminate. There is reasonable confidence and evidence that commonsense good use guidelines continue to work and that teachers working with kids and their parents continue to shape values and guide judgement [http://www.edna.edu.au/EdNA].

At a general level EdNA is acting as a reputation manager and we could extend this function by allowing sites to brand through their reputable alliance with *EdNA Online*. This is an area that offers some opportunity through branding, through benchmarking good practice and through conducting and applying research.

Filters

There are, of course, dangers in applying filtering technologies even for the most pragmatic of survival reasons (the EdNA Online searching filters are an example). In order to manage their time the information literate can choose to define relevance so narrowly in order to manage their time that they filter out the uncomfortable voices that challenge their comfortable assumptions.

> They would not have to hear the civil rights marcher, take a leaflet from the striking worker, or see the unwashed homeless person. Their world would be cleansed of all interactions save those that they explicitly chose.[11]

Where does our definition of literate end? Can you be information literate and choose to ignore what you have excluded? Are there values or obligations attached to the privilege of being information literate? Certainly this has to be one of the major concerns of education. We need to teach the dangers of narrowing a perspective. Even within *EdNA Online*, we are conscious of the danger of presenting too narrowly a government approved view and we try to counterbalance this view by indicating the views of forces opposed to government policy. An area we have not, but need to address is the seeking of views about education from non educators.

Identity

We have not consciously utilised technologies that require users to adopt an avatar on *EdNA Online*. However such technologies have very clear potential for learning and information gathering. There are also circumstances in which role playing would be useful. In our online forum in August 1999 we did provide instructions that pointed out the dangers of revealing too much personal information online and suggested to students that there may be circumstances under which they might prefer adopt a nickname (a kind of *nom de mouse*). [http://forum.edna.edu.au/frame.asp (choose register)]

The practice of role adoption is so common on the Internet that we need to incorporate it into the repertoire of the information literate.

Iconography and metaphor

> The metaphors and images used in icons are cultural constructions. As such they are not 'transparent' to all users of the programs. Some users may find it easy to understand them while others may have difficulty depending oh their cultural and socioeconomic background. Variation in the construction of icons and their placement on screen compounds this problem, as the user is required to shift their reading orientation. If this is the case then users may neglect to select a 'useful' tool or pathway as they have difficulty understanding or predicting what might be contained within or what the move may accomplish.[12]

Many of the debates we have had in developing *EdNA Online* have been debates about symbol and representation. The current navigation panel of *EdNA Online*, for example, is the result of much debate and several previous iterations that were used for several months before the current one was implemented. The discussions continue and further iterations are occurring. Even the words used often do not convey the designer's intention. For example, the 'About EdNA' button on the navigation panel takes the user to an extensive set of pages about the EdNA networks, the EdNA Standards, publicity material about EdNA and a brief history. Usability studies indicate many users expect it to contain a single page about the EdNA software platform. We have failed to use the medium adequately. Information literate new users of *EdNA Online* will use the search function to locate the information another way. The button is therefore wasted.

> The digital world is one of fast pace, movement, quick (surface) reading and comprehension. Thought about where to go is based on intertextual knowledge – other programs, other symbols, knowledge of the topic. Users prefer to take routes that look familiar, risk taking only as a result of lack of success. But frustration and lack of success may also inhibit the user engaging with parts of the program if they appear visually or textually not to be relevant or incomprehensible.[13]

Furthermore, there is an ongoing debate about the need for a special metaphor based *EdNA Online* interface for young children and their parents and teachers. This is a debate about literacy and the symbol system needed to bring young children into the information literate community. What is not in doubt is the need to establish early childhood educators and clients as an online community on *EdNA Online*.[14] This community could then explore the required entree for young children.

Children appear to recognise the visual symbols of navigation more readily than those who have been school in verbal symbols. The capacity of icons to assist in the management and use of information is clearly enormous. We know, however, very little about how useful, or how they work.

> Although it is believed by many that metaphors hold great potential value to teaching, there is little, if any, empirical research demonstrating the claimed benefits of metaphors and the usability of metaphor types such as the composite metaphor and the spatial metaphor[15]

There has been debate, for example, about the appropriateness of the literal images of the EdNA Toolbox [http://www.edna.edu.au/toolbox].

Information manipulation

To make judgements about a book we read the cover, we read a review or we ask a friend. I store and retrieve information from books by a combination of notes stored on my computer and sticky tags attached to pages I wish to recall. This allows me to find and reuse information quickly and to make comparisons between one book and another. I even sometimes use colour coding to assist. I keep a record of my crime books on a database – utilising my librarianship skills in a personal environment.

Digital systems have a high capacity for aggregating, linking, storing and also disaggregating and reconstructing. But they require a good deal of planning to maximise this capacity.

Information management and organisation has a high level of importance on *EdNA Online*. From the beginning we have been interested in and given resources to metadata. The more successful EdNA is the more convinced we are of the importance of metadata. This is why we have taken pains to develop the EdNA Metadata Standard [http://www.edna.edu.au/metadata] and have it recognised as the Australian education standard. It is why we participate in international forums to ensure our standard is globally interoperable. The principles of metadata are critical ones for the seriously information literate both as users and creators of information. Our resource discovery, our site harvesting and many of the learning projects of our stakeholders are dependent on metadata.

The demand is increasing, particularly within the schooling sector, for finely tuned accuracy in identifying resources in order to allow teachers to match resources to particular outcomes. We would hope in the future to be able to build systems that use natural language and build the back office functions to make the links. This should mean less and less need for library skills and more and more work for information specialists to build the back office functions.

Poorly planned information systems lose flexibility and accuracy. We will always be looking to highly information literate for smart solutions – trying to ease the burden on the user.

The environment in which information is deployed

Perhaps the most interesting aspect of information literacy is the change to the environment in which it is deployed. It is not only the changes wrought by the use and creation of information and communications technologies in everyday affairs and work that are transformed but also our perception of ourselves and our society – our culture and history.

The context in which we apply information literacies is by its very nature a shifting one.

> Social perspectives on technology are diverse. For example, a wind farm might be welcomed by 'greenies' but be rejected by the community that has to live next door to it. Recognition of these differences is written into the curriculum, opening up the possibility of different knowledge frameworks forming a foundation for technological learning. Technological knowledge is not thought of as being 'true' facts but rather is seen as being knowledge that evolves and changes in different social contexts.[16]

Within the EdNA community the schooling sector will have a perspective on online chat which is different to that of the higher education sector. Each sector will have a different skill set in applying conferencing technologies. Mathematics teachers are likely to apply it in a different way to university librarians. What we may one day be able to do within the EdNA environment is to capture and share these different perspectives and skill sets so that we can create new learning.

Inevitably, the social contexts are shaped by the technology. The fact that all sectors have committed to working with one another changes the social within which the technology is applied.

Nor should we underestimate the demands placed on the context of the classroom itself by information technologies.

> As a means of describing classrooms, whether 'technologised' or not, 'complexity' gives the classroom teacher useful ways to think about many of the classical problems of working in a classroom. Instead of seeing new technological developments for the classroom as 'add ons', they become active things in the classroom, just as capable of forming powerful liaisons with students as with the teacher. Internet access, for instance, brings into the classroom a new set of agents (remote computers, students and teachers in other classrooms in other parts of the world) who will negotiate their roles and the roles of others in the classroom. In this sense, complexity is not seen as a problem but as a means of characterising the large number of inter-relationships that shape classroom practices.[17]

So managing the machines and the access demands a set of information and communication management skills of the teacher, but also of the student. While the student might be the centre of an individual learning program, the student is also only one player, even in his own learning. There is a lot more to manage and to be negotiated. These issues are not yet being consistently addressed in mainstream professional development programs.

> Thus, teachers' perceptions about allowable levels of student movement around the classroom, arrangements of furniture, and levels of noise from student talk and use of materials, have implications for what kinds of activities and social learning groups he or she will try to establish. How successful teachers are depends in large part on their capacities to negotiate with

> technologies that are much less compliant than students, and students who often are more skilled than teachers at assigning roles to new communication and information technologies[18]

The EdNA Schools Advisory Group contribution to the *Action plan for the information economy* identifies professional development as a priority issue for the information economy, a priority with which other sectors concur.

The final contextual matter on which this paper comments is demand for changes to the way democratic processes operate.[19] Technology makes possible far more direct opinion gathering, consultation and discussion. There is still much debate about the effectiveness of the Internet to deliver some of these outcomes in anything but a consumer context. However it is certainly possible to develop a direct dialogue with a user or customer base using the Internet, and to develop services based on this dialogue. Our experience with *EdNA Online* demonstrates this. After two years, while our key stakeholders, the education and training providers and funders are important, we have a solid base of direct users whose opinions and demands are to be reckoned with. In the future they will drive the development of the service – not the stakeholders. This power in the hands of the user could result in elitist or populist services if civic and democratic values are not under held by our user group generally. These values are fundamental to our future. Education and the media are the two main institutions that can ensure these values are the values of the information literate.

Issues

The issues that have emerged from EdNA in relation to information literacy largely mirror the issues emerging everywhere in educational institutions. The most important one is perhaps the last one mentioned above, to what use do we put information and in particular, how can we use it to further democracy? Are we as an education community committed to this?[20]

Secondly, what is the relationship between literacy, information literacy and technological literacy? Would we be better to try to separate these areas or, in the interconnectivity of the networked world, do we need to see these holistically? Has 'literacy' lost its meaning? Certainly, the perspectives of librarians, technical developers and educators can sometimes be distinguished within the EdNA community, but at other times they are indistinguishable. And to the end user the distinctions are irrelevant.

Thirdly, there is a tension about whether we first address the information literacy of teachers or whether we work firstly with students. *The digital rhetorics* report[21] came down on the side of teachers first. Will history support this? So far the EdNA network has made the profession its focus. We know we can do that well. At some point, however, we will need to address the issue of students.

The fourth issue is the tension of the individual versus the community. Certainly the new technologies give a power and control to individuals and use the individual as an organising unit. Educators recognise the nexus between literacy and disadvantage and continue to work to ensure literacy is the most basic right of disadvantaged communities. Information literacy is as much a key to future success and the capacity of technology to empower individuals presents real challenges to educators working with disadvantaged communities. While some individuals within disadvantaged communities may benefit there need to be solutions that address the disadvantage of groups and propose group solutions.

Literacy is not a construct that exists outside the values of the society generally nor outside the values of the education community. We need to be involved in and to shape the debates, policy and the resourcing of information literacy delivery to ensure that it is applied in a way that builds the society we want, the community we wish to be part of. To return to our original gun analogy. As educators we may not have much expertise in gun technology and distribution. But we have the capacity to influence and maybe control the design, use and some of the environment in which information literacy is deployed. EdNA is a very small part of that scenario, but we hope to continue to use it to contribute to an information literate population.

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PUTTING IT ONLINE: INFORMATION RESEARCH SKILLS FOR POSTGRADUATES

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Abstract *The nature of teaching and learning is changing radically, and increasingly students will have the opportunity to learn in a manner that is independent of time and place. The emphasis is to provide a choice of mode to suit individual learning styles. These changes, plus the need for academic libraries to move from instructing students in the use of specific information or library resources to enabling students to become information literate, were the impetus for the development of an online tutorial in information research skills for higher degree students at RMIT University Library.*

The *Teaching and learning strategy* at RMIT University emphasizes flexibility in course design, delivery and teaching processes to make full use of the new converging technologies. It also encourages a variety of teaching strategies to facilitate intended learning outcomes and enhance educational experiences. The emphasis within the university is to maximise student choice of course structure and learning experiences. At RMIT University, information literacy is increasingly recognised as an essential graduate attribute. Information literacy is a lifelong skill because it equips students with the skills to function effectively in education and work environments that are characterized by the need to identify and manage increasing volumes of information. Information literate people 'know how to find, evaluate and use information effectively to solve a particular problem or make a decision'.[1]

Background

Since the mid 1970s, the liaison librarians at RMIT University Library have taught information research skills as a formal part of a number of research methods subjects. Initially established for higher degree by research students, since the eighties these classes also have been taught in higher degrees by coursework and honours courses.

The aims of the postgraduate information research skills classes are

- to provide students with an overview of the information research process, including planning, implementing, managing, and evaluating the process
- to enable students to develop a systematic method of searching for information
- to raise an awareness of the wide range of information sources available
- to make participants aware of the need to evaluate sources of information.

The classes usually have a formal assessment component, which students have to pass to gain a pass mark in the research methods subject. Library liaison staff have used a range of teaching techniques, presentation styles and formats throughout this period, with the current phase being the use of online delivery to take account of students' different learning styles and existing knowledge levels.

The team had deliberately selected, as the initial class to be converted to flexible delivery, a research methods class in which the students come from a range of disciplines. By developing a multidisciplinary prototype, the intention was to be able to use it immediately, with a minimum of alteration, for other research methods subjects. The long term aim was to develop a generic online information research skills tutorial relevant to students from a range of disciplines; appropriate for both coursework and research level students; and able to be used either to complement face to face class contact or in an independent mode for onshore and offshore courses.

How did we go about developing an online tutorial?

An important consideration in developing the online tutorial was the background of the students. There is a significant proportion of international students enrolled in the research methods subject selected, and many of the other research methods subjects are comprised totally of international students.

In 1998 at RMIT, there were over 6 000 international students studying onshore with 18 per cent of the total of students at RMIT studying in Melbourne. In addition to this, over 5 000 offshore students studied RMIT courses in 10 countries. The background of students in terms of their knowledge of information resources and search strategies can have an influence on their comprehension, participation and learning capabilities.[2] 'NonEnglish speakers have a difficult task both in mastering the search interface and in developing the language skills needed to apply keyword and controlled vocabulary searches.'[3] It would appear that many international students prefer to be taught information retrieval skills on a one to one basis because of language problems, unfamiliarity with library systems and technology,[4] and the online tutorial is designed to address this by allowing students to work at their own pace using ideas that had been covered in class.

The Association of College and Research Libraries identifies the following five competency standards for information literacy.

> 'The information literate student
> - determines the extent of the information needed
> - accesses needed information effectively and efficiently
> - evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system
> - uses information effectively to accomplish a specific purpose
> - understands the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.'[5]

In late 1998, the liaison librarians started the process of constructing the content of the online tutorial by identifying the core skills or competencies in information research as being able to

- understand a research topic and identify the important aspects of the topic
- define the extent of the search for information required
- develop a list of alternative keywords for the topic's aspects
- understand the use of Boolean and proximity operators to develop search statements
- develop an awareness of how information is published and organised
- identify and prioritize appropriate resources to search
- develop a research strategy
- understand the necessity of evaluating the resources searched and the search statement used with each resource
- identify the type of references found
- locate the full text of the references
- evaluate information found
- cite references in an established citation style.

In addition, problem areas were identified from observation in class and from the students' assignments. This produced a second list that was used to decide the priority order for developing the online modules. The third list developed comprised topics not covered in class because of lack of time, but that ideally should be. These were usually covered in the resource book issued to students.

The tutorial currently consists of three modules

Developing a search strategy
Database searching
Locating the full text

The fourth module in the original development list, which did not see the light of day due to lack of development time, was *Identifying references*.

The need for the modules to be generic was constantly borne in mind during the development process. This would mean that the short term intention, of using the modules in other research methods subjects in which the team teach, could be achieved easily with no amendment to the tutorial content.

The modules were designed to be inward focussed and linear. The decision was taken not to provide links out of the modules. The aim was to keep attention focused and to make it a straightforward process to progress through a module. Sections of modules are clearly sequential. Besides making clear the direction to take, this was also intended to give a user the feeling of always progressing, always moving forward. The modules are designed so that the student does not have to go backward; links at the bottom of pages indicate that the student is moving forward. The only dead end is after students have submitted an assignment at the end of a module.

The intention was to build a high degree of interactivity into the online modules. This was not as easy as the team had hoped. The quizzes built into the modules were intended to reinforce skills and test key competency areas covered earlier by the text and examples, and to provide immediate feedback to students. Normally students are asked to apply techniques or processes to their own research topic. However the quizzes could not be marked automatically, and therefore provide immediate feedback, unless the topic was predefined. So one multidisciplinary search example is used throughout the tutorial. It is used to develop keywords and to demonstrate the use of boolean operators and for all the quizzes.

The team had concerns about how multiple choice questions would work with this subject matter. 'Drag and drop' exercises were preferred for some quizzes, but eventually were not used because they required plug ins, and having to download a plug in interrupted progress through a module, as well as introducing unnecessary technical difficulty. The interactivity in the modules has been identified as an area for development.

Assessment

The quizzes do not form part of the assessment for the information research skills classes. There is an assessable assignment at the end of each module. However, data will be gathered on the success rate of students' attempts at the quizzes.

In the past, students had completed one assignment at the end of the two classes/laboratory sessions. The assignment required the students to use their thesis topic to undertake a simple catalogue search, to provide one reference identified using an electronic indexing service and to search the *Science citation index*. Students were not asked to detail the development of their search statement. Tying the assessment to the online component of the subject has meant it has been broken into three separate assignments. The assignments mirror the work covered in the modules, but require the students to apply techniques to their own thesis topic. Explicit in the questions is the need to demonstrate a mastery of the process and the ability to apply it. This has allowed us to more easily check a student's understanding of building a search statement.

The assignments cannot be marked automatically, like the quizzes, but are marked by the liaison librarians as they were in past years. It was felt that to change this would diminish the relevance of the assignments. The three assignments have the same submission date.

Evaluation and effectiveness of the online tutorial

Data for the evaluation of the research skills classes have historically come from three sources: feedback solicited from the students, the observations of the library staff teaching the subjects, and feedback from academic staff responsible for the subject.

Students have always been asked to give feedback on the information research skills classes. They are asked to assess whether the educational aims of the sessions were achieved, to evaluate the usefulness to them of the topics covered in the classes, and to comment on the assignment as a learning exercise. This data is used in conjunction with feedback from library and academic staff, and with the results of the assignments, as a guide to assessing the effectiveness of the teaching methods and identifying student learning difficulties and needs.

The team decided to use essentially the same approach, but with extra feedback and assessment mechanisms, to evaluate the online tutorial. Follow up feedback is now solicited from students three months after they have completed the research methods subject to ascertain if they have been able to apply the knowledge gained from the classes and the online tutorial, and to gauge the value they place on each mode. Data related to the success rate of students' attempts at the quizzes will be gathered, and the online tutorial also contains a mechanism to allow users to give instant feedback.

There was discussion around the measures to adopt to ensure students worked through the online modules. The concern was that if the modules contained significant material that was not covered in class, and students did not complete the required module between the two classes, they would be unable to participate in the second class or the hands on laboratory time. It was decided therefore that initially the modules would be used to backup content covered in class so that students attended the classes and in their own time completed the modules. This was important given that classes often had a high percentage of international students. In second semester however, module one was incorporated into the class as a supervised laboratory session and used to replace part of the class content. This was to allow observation of students' progress through the module, to see if the module could substitute for face to face teaching of concepts, and to ensure more detailed feedback from the students.

The existing modules have been used for two semesters with the original research methods subject and for one semester with a masters course in business. Data has been collected for both first and second semester (Appendix 1). Data from the follow up questionnaire sent to semester one students is available (Appendix 2).

Early feedback from students in 1999 has indicated that students find the online units useful but they still want a face to face component to the class. They place, and have always placed, high value on the hands on laboratory session that provides the opportunity to investigate sources of information using their research topic. In second semester students found it useful to complete one of the online units as part of a supervised laboratory.

What next?

The postgraduate tutorial is still under development. When fully developed, it is intended that it will provide a structure for students to project manage the research for their thesis, from the planning through to the evaluation stage. The additional modules planned for 2000 are the information research process and evaluating references. In 2000, the tutorial will be rebadged as a generic postgraduate tutorial and used with a number of the team's other research methods classes, across most of the faculties.

The intention is to use the online tutorial in different class situations. Data will be gathered on using the tutorial in a variety of modes: as part of the hands on component of a class, as a supervised laboratory, or as a totally flexibly delivered package. The current tutorial can be accessed at any time via the Library web site and when fully developed as a generic package will provide a complete reference to the information research process. The tutorial has a search facility and a site map so it can be used as a reference resource. When the generic version of the tutorial is positioned on the library website, the team intends to gather information on whether it is being used as a just in time resource by students when they have a need to know rather than as a training package. In November, the team will be reassessing the structure of the classes in an attempt to free up more time for hands on laboratory work.

The tutorial as it stands has been used as a training package for library staff who are new to the information/reference desks. This was conducted as a supervised laboratory session with a group exercise at the end. Staff completed the assignments as part of the training, and also provided valuable feedback on the online modules.

Development of a tutorial for academic staff is underway. Although this is based on the current postgraduate modules, it was anticipated that academic staff would want to approach the tutorial in a different manner. The postgraduate tutorial can be compared to a textbook that students work through sequentially, while the staff tutorial will resemble a reference book that provides quick access to information at any point. The front page of the tutorial for academic staff will illustrate the information research process, but it will provide 'quick look up' access rather than a linear progression through the tutorial.

This is the beginning of the process of incorporating flexible access into information research skills classes at RMIT. The technology should make it possible to provide more flexible learning options. It is hoped that this will provide greater opportunity than has been available in the past to set information research skills classes in the broader context of information literacy and to further the ability of students to become critical and independent learners.

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APPENDIX 1

Feedback from Semester 1 and 2 classes

How would you rate these aspects of the Information Skills sessions for usefulness and relevance?

Not useful			Very useful			
	1	**2**	**3**	**4**	**5**	**Sample size**
SESSION 1						
Explanation of the structure of information	1	2	11	19	8	41
RMIT libraries catalogue demonstration	2	2	10	14	6	34
How to formulate a search strategy		1	10	16	13	40
Searching electronic databases		1	11	13	15	40
SESSION 2						
Searching the *Science citation index*		2	4	18	17	41
How to locate and obtain materials not held at RMIT		1	9	19	13	42
Keeping research up to date		3	13	19	6	41
Hands on- laboratory time	2	2	13	13	12	42
Resource book		1	8	22	11	42

How would you rate the online units? (This is how the question was asked in Semester 1)

Rating	**Number**	**Comments**
Helpful	13	• A flow chart of search strategy with one specific example • Made me aware of resources • Gave a good opportunity to review and to tailor search to my specific requirements. • I like the html format • Tied in with the class • They did tie up the classes nicely. The issues covered were already clear.
Alright	2	-

How would you rate the online units? (This is how the question was asked in Semester 2)

Not useful		Very useful			
	1	**2**	**3**	**4**	**5**
Online unit 1:Developing a search strategy			1	4	2
Online unit 2: Database searching		1		4	1
Online unit 3: Locating the full text			5		
The **exercises** in the online units		1	2	2	2

Comments

- Enhance my skill for searching literature
- More time
- Without this class I would probably have wasted of a lot of my own and a librarian's time
- Where does the search for information end?
- Content was good. As a new student to RMIT, topics such as effective use of the catalogue and what info resources are available was good
- The library session would have been extremely useful (huge time saver) had it been carried out in the first two days of starting my thesis *(3 comments)*
- I would have appreciated learning about all this earlier so that I would not have had to find by trial and error
- More equipment or smaller class sizes. *(6 comments)*
- Everyone in the class had different level of knowledge about the library resources. Should separate into different

groups
- Content - it is all useful to know where a wide variety of information is and how to obtain it
- More time for hands on use of facilities *(3 comments)*
- Module offered outside of business hours eg after 5.30pm
- Clear, brief, concise, to the point explanations and examples
- Computer chairs are not sufficiently ergonomic
- Content - especially regarding citation indexes and electronic databases. Friendliness and approachability of the staff
- Extra time to work hands on (extra/longer class) for external students
- The presentation was very simple and easy to understand
- Good course, should have a general class session once a semester to interact with liaison librarian after good use of library
- Excellent in most circumstances
- The course demonstrated the wealth of information available and, more importantly, how to tap into it efficiently and effectively
- Great course, great notes. Thanks

APPENDIX 2

Follow up feedback from Semester 1

SEARCH SKILLS

How would you rate your search skills before the classes, and now?

	Basic	Good	Very Good	Excellent
Before classes	3	2	2	
Now		2	4	1

FUTURE FORMAT OF CLASSES

Would you rather

Maintain a face to face component?	6
Complete it fully online?	1

Comments relating to format:
- I liked the web styled learning
- The online units utilised clear explanations and examples to complement what was delivered in the classes. Having the units online enables easy look up access ie for correct referencing styles
- I think human contact is preferable, as it is reassuring to ask for help when you do not understand something
- I think the face to face component enables us to reinforce what we are learning by listening to what others offer in class discussions
- This is a completely new topic for most and no doubt others also had questions coming up while doing the assignments which they needed assistance with. This is of course a little difficult when attempting them after hours

General comments
- Do the rest of the course of CH700 using online units. Other units (not library) were boring in lectures but could be a lot more interesting and a lot more quickly and effectively taught through using online units. Online units for non library units would save on travelling expenses. Cost of room hire etc (a lot of my degree could have been done by online units)
- For future class, try to organize more time for practice of some strategies
- I think these classes are an ideal and beneficial way to begin any postgraduate research
- The most important thing I got out of the classes was the identification and use of the different databases, which I had never used.

CHANGING THE MINDSET: CREATING INFORMATION LITERATE ENGINEERS

Anne Draper and Leith Woodall
University of Queensland

Abstract *This paper looks at the key issues facing engineering graduates, the new directions in engineering education and the initiatives undertaken at the University of Queensland to integrate information literacy into the engineering curriculum.*

The following comment provides a challenge to both engineering educators and librarians to work together to ensure that information literacy is recognised by future engineering graduates as a key competency they will need to meet the demands of their professional careers.

At university we have librarians, at work we have secretaries, who needs information literacy? (a practicing engineer)

The changing face of engineering

The engineering profession is currently facing many challenges and the rate of technological change is having a major impact on it. Smerdon[1] refers to the findings of the National University Continuing Education Association that the half life of an engineer's technical skills – how long it takes for half of everything an engineer knows about his or her field to become obsolete, is 7.5 years for a mechanical engineer, five years for an electrical engineer and only 2.5 years for a software engineer. These figures were published at the beginning of the decade and would now be considered optimistic.

In addition to technological change other social trends such as globalisation and corporate downsizing are impacting on the career paths of engineers who can no longer anticipate developing skills in one well defined area of engineering and expect to remain in that area for their entire working lives. Engineers will need to constantly reinvent themselves and be capable of changing career paths.

The role of engineers as pure technical functionaries is being challenged by the notion of the new engineer 'who is aware of the social dimension and context of engineering work and takes responsibility for its consequences'.[2]

The latest review of engineering education in Australia, *Changing the culture*, notes

> In the emerging knowledge economy the demand is for people with a broad range of knowledge and understanding with ability to address not only the technical dimension (which never occurs in isolation) but also the financial, legal, marketing, organisational, environmental, social and ethical aspects.[3]

How are engineers to ride what Smerdon describes as this 'whirlwind of change'?[4] His solution and that of engineering educators is 'having engineers who are constantly learning, constantly upgrading their skills and constantly upgrading to new situations'.[5]

Professional bodies such as IEAust have recognised the need for engineers to update their skills and have instituted certification schemes and continuing professional development programs. Companies such as Boeing and Motorola have also responded to this need by providing extensive in house training and educational opportunities for engineers.

Engineering education at the crossroads

Engineering educators have recognised the need for a cultural shift in engineering education to produce graduates committed to lifelong learning. The review of engineering education in Australia *Changing the culture* acknowledged the need for change and noted that 'the focus of engineering education will be on creating lifelong learners from early education through undergraduate education to continuing professional education'.[6] Similarly a review by the United States Board of Engineering Education envisages that future engineering graduates will have 'greater intellectual breadth, better communication skills, a penchant for collaboration and a habit of lifelong learning'.[7]

The need to produce graduates capable of lifelong learning has seen educational institutions shift the emphasis from teaching to student centred learning. To be effective student centred learning will require that students in their pursuit of knowledge develop the skills to manage information, that is to become information literate.

The relationship between information literacy and learning is best summed up by the definition of information literate people as

> ... those who have learnt how to learn. They know how to learn because they know how knowledge is organised, how to find information and how to use information in such a way that others can learn from them because they can always find the information needed for any task or decision at hand.[8]

Traditionally engineers have not demonstrated these critical information skills. User studies[9] of the information seeking habits of engineers have found that accessibility of information rather than quality has been key factor in their choice of information source. Ellis and Haugan[10] found engineers turn to the channel that was most accessible, based on the criterion 'least average rate of probable work'. This is reflected in their preference for informal sources of information such as colleagues, reliance on familiar if outdated texts and use of internal company reports. With the volume and complexity of information now available and easy access to the Internet it becomes even more critical that engineering graduates develop good critical information skills.

Integrating information literacy into the engineering curriculum

Information literacy is a cornerstone of lifelong learning and in recognition of this, librarians from the Dorothy Hill Physical Sciences and Engineering Library and the academic staff of the School of Engineering at the University of Queensland have been working together over several years to design a comprehensive information literacy program which is integrated into the engineering curriculum.

In our experience, to be effective, an information literacy program needs to be integrated into the curriculum, needs to be meaningful to the students and staff and needs to be assessable. Engineering students have a heavy workload and it is important that information skills programs should be closely linked to the academic content of a subject. This can be done in the first year of the Bachelor of Engineering degree because all students study a number of generic, core subjects. Similarly in fourth year all the students have to do a thesis subject, and it is relevant to include an information skills program in this subject.

In second and third years, when the students select subjects in the area of engineering in which they wish to specialise, there are no subjects common to all engineering students. The subjects we have identified as suitable for an information literacy component are the design or process engineering subjects.

The goal of our information literacy programs is to produce graduates who have the capacity to locate, retrieve, analyse and use information from available contemporary resources using the most efficient methodology.

An outline our information literacy program is contained in the table on the following pages.

Table 1: Summary of information literacy program for Bachelor of Engineering Students

Year and subject	**Aims of subject**	**Format of information literacy program**	**Learning outcomes**	**Form of assessment and criteria for assessment**	**Form of evaluation**
1st year Introduction to professional engineering	Experience in working effectively in teams Experience in managing a project, and your time Practice with professional engineering tools, including written, oral and graphical communication, word processing and spreadsheets, and using technical information sources Exposure to the past, present and future role of engineering in society, especially in Australia[11]	Orientation Tour Online workbook which gives useful reference materials, databases and web sites, guidance in designing a search strategy, how to cite references Library workshops: introduction to the workbooks, databases, the Internet Lecture with four tasks • Make a list of information sources • Consider why we cite information sources in a bibliography • Identify the element you should include when citing 1. books 2. websites • List criteria that could be used to critically assess an information source and give reasons why it is important (indicators) Bulletin Board and Chat	Use the library confidently and competently Recognise the variety of information sources Recognise the importance of information in engineering practice Evaluate the information found Cite the information used	Online quiz to test knowledge of the library layout, Boolean logic, truncation, citation styles and interpretation of bibliographic references Report bibliography: references are relevant; there is a variety of information types; citation style is consistent and correct	Evaluation forms Focus groups Lecturers' feedback
2nd Year Process Systems Analysis Chemical Engineering	Understand : Basic principles of process engineering Tools for process analysis and application to economic and environmental impacts Techniques for decomposition of large complex systems to smaller problems	Hands on workshop Defining the topic Library webpage Reference materials Databases Internet searching Evaluating internet resources Citing information	Reinforcement of skills learnt in first year Learn about specialist reference material, and more databases	No library assessment Lecturer assesses the correctness and consistency of the citations	Evaluation form completed by students Positive anecdotal feedback from lecturer and students

Table 1: Summary of information literacy program for Bachelor of Engineering Students

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1st year Introduction to professional engineering	Experience in working effectively in teams Experience in managing a project, and your time Practice with professional engineering tools, including written, oral and graphical communication, word processing and spreadsheets, and using technical information sources Exposure to the past, present and future role of engineering in society, especially in Australia[11]	Orientation Tour Online workbook which gives useful reference materials, databases and web sites, guidance in designing a search strategy, how to cite references Library workshops: introduction to the workbooks, databases, the Internet Lecture with four tasks • Make a list of information sources • Consider why we cite information sources in a bibliography • Identify the element you should include when citing 1. books 2. websites • List criteria that could be used to critically assess an information source and give reasons why it is important (indicators) Bulletin Board and Chat	Use the library confidently and competently Recognise the variety of information sources Recognise the importance of information in engineering practice Evaluate the information found Cite the information used	Online quiz to test knowledge of the library layout, Boolean logic, truncation, citation styles and interpretation of bibliographic references Report bibliography: references are relevant; there is a variety of information types; citation style is consistent and correct	Evaluation forms Focus groups Lecturers' feedback
2nd Year Process Systems Analysis Chemical Engineering	Understand : basic principles of process engineering tools for process analysis and application to economic and environmental impacts techniques for decomposition of large complex systems to smaller problems	Hands on workshop Defining the topic Library webpage Reference materials Databases Internet searching Evaluating internet resources Citing information	Reinforcement of skills learnt in first year Learn about specialist reference material, and more databases	No library assessment Lecturer assesses the correctness and consistency of the citations	Evaluation form completed by students Positive anecdotal feedback from lecturer and students

BEST COPY AVAILABLE

As the information literacy programs we run for first and final year students are our most established programs and contain an assessable component we would like to focus on them and provide some additional background information on these programs, assessment and evaluation of them. The second and third year design and process engineering subjects provide the opportunity to introduce students to specialised information resources such as standards, patents and product information.

The first and final year information literacy programs include an assessment component. Assessment serves several purposes: it confirms the quality of student learning, it reinforces learning and it emphasises the importance of class content and ensures students attend sessions.

The University *Teaching and learning enhancement plan*[12] emphasises that feedback should be sought from students. This feedback can be used to improve subject design and delivery. Evaluation for all the programs was sought from students by: written evaluation forms, by seeking feedback from academic staff involved with the program, from personal observation of library staff involved in teaching the programs and from the quality of the assessment. The first year program also involved feedback from a focus group.

First year program

The first year information literacy program is integrated into a problem based learning subject *Introduction to professional engineering*. This subject gives the students an early experience of what it is like to be an engineer.

There are a number of factors to consider in developing the information literacy program for this subject. The majority of students are straight from school and more than 50 per cent are males. A study of student attitudes to the library found that female students were more focused on the end result, and more likely to seek help, but males students saw finding help a sign of weakness.[13] Engineering students in general are highly computer literate, but this does not mean they are necessarily information literate. Bruce[14] found that most students did not learn to access information resources in detail until either late in their undergraduate studies, or as postgraduates. To successfully complete this subject, the students need to develop a number of information literacy skills early. First year engineering is a large class. In 1999 there were over 500 first year students. The information literacy program had to be delivered to this large group in a short time. The most effective way to reach the students quickly was to put most of the information literacy program on the Internet. Using the Internet also gave the students flexibility in where and when they completed the information literacy program.

The information literacy program, known as *Starting points* was incorporated into a subject webpage, which included lecture notes and other subject related materials. Each year there are five different projects for this subject, and the librarians create an information literacy webpage for each project. This is done so all the examples used are relevant to the project.

First year assessment

There were two stages to the assessment of the first year information literacy program: a quiz worth 8 per cent and the report bibliography worth 5 per cent of their final subject assessment. In addition to this assessment, a question on the information literacy program was included in the examination of this subject.

The quiz was associated with the *Starting points* in the webpage. The skills tested by the quiz included understanding searching, using Boolean logic and truncation, interpreting bibliographic citations and knowing what to include in a citation. The quiz also tested the students' ability to use the library catalogue and find their way around the library. All the students passed this quiz, and as can be seen from the evaluation (Appendix 1), 47 per cent of the students found the quiz somewhat or very elementary. In addition to the quiz, the librarians marked the project bibliography. The following criteria were used to assess the bibliographies

- were there a variety of information types
- was the information relevant to the project
- was the citation style correct and consistent

This year, all the projects had a bibliography, and most of the students passed.

First year evaluation

In the week after the information skills quiz was due, all the first year engineering students were asked to complete an evaluation form. Three hundred and seventy six completed evaluation forms were received. The students were asked to evaluate aspects of the course on a scale of 1 to 5 (1 being strongly agree and 5 being strongly disagree) Students were also asked for written comments. Appendix 1 summarises the quantitative data.

In general, the students found the information literacy project would be helpful in completing their engineering project. The most useful aspects of the webpage identified by the students were

- *Starting points* (35 per cent)
- library website (9 per cent).
- writing bibliographies (7 per cent)
- bulletin board (7 per cent)

The useful aspects of the library classes were

- bibliographic databases (17 per cent)
- library website and its many resources (9 per cent)
- searching the Internet (3 per cent)

A focus group of seven students provided useful feedback on the information literacy program and suggestions for future developments. The students would like the webpage to be for the whole subject with the information literacy program more fully integrated. They would like more interaction with lecturers and tutors on the bulletin board. This will require more effective liaison to achieve.

Final year thesis project

The final year thesis project provides an ideal opportunity to integrate a comprehensive information literacy program, as the subject requires students to complete a comprehensive literature review and undertake independent research. As The University of Queensland has five engineering departments, considerable effort needs to go into liaising with academics to ensure a uniform program. The program combines a lecture, workshop and assessment to achieve its aims.

The program is based on the *Big six skills* approach proposed by Eisenberg and Berkowitz.[15] In terms of the program outcomes we expect that students will demonstrate these six skills

- task definition: determining the purpose and need for information
- information seeking strategies: examining alternative approaches to acquiring appropriate information to meet defined tasks
- location and access: locating information sources and information within sources
- use of information: using a source to gain appropriate information
- synthesis: integrating information drawn from a range of sources
- evaluation: making critical judgements about information sources.

Final year assessment

In order to determine whether the learning objectives of the final year information literacy program have been achieved students are required to complete an annotated bibliography on their thesis topic. The bibliography was accompanied by a page listing the databases and other information sources searched and the search strategy used.

The bibliography lets the students demonstrate that they have acquired a number of information skills and are able to

- define their information problem
- identify appropriate information sources
- search the information sources
- analyse and evaluate the information they found
- synthesis the information and relate it to their thesis topic
- cite their references according to a prescribed format.

Librarians developed the marking scheme with academic staff. The basic criteria for marking the bibliography were that students include a variety of information resources, relevancy of the references to their thesis topic, consistency of bibliographic style and quality of annotations.

Final year evaluation

The evaluation forms completed for the final year program asked students to weight the usefulness of the course on a scale from 5 to 1 (5 being extremely useful and 1 being not useful). The average of total responses for each discipline is outlined in table 1.

Table 2: Average rating of course usefulness 1999

Disciplines	Average rating
Civil	4.47
Chemical	4.02
Electrical	4.25
Mechanical	4.42
Mining	4.58
Minerals Processing	4.77

Evaluation forms asked students to consider the most useful aspects of the course. A list of the most useful aspects of the course as indicated by students follows

- using and searching databases
- general skills for finding resources
- research starting points
- learning more effective search techniques
- many options for searching for information
- effective research on the Internet
- patent information
- being given the time to practice
- document delivery services

Comments made by students regarding the classes are as follows

The need for information is never ending.
Although I was relatively competent, the few extra tricks I learned will be a benefit.
It will be very useful.
I have found many potential references for my thesis.
Teaches you how to use/search information from a broad range of databases.
It was a good introduction – especially for those that didn't have much of an idea to start with.
Help to search for data more efficiently.

The responses from both evaluation forms show that the students found a task focused learning strategy extremely useful to their research. In addition to this, it is evident that they perceive that the skills they acquired or reinforced in the classes are integral to their future career as engineers and consequently on the path of lifelong learning.

Future directions

The present information literacy programs are evaluated by students and staff and the programs will be constantly evolving to respond to needs. At an institutional level the Library Committee Working Party on Information Skills is recommending to the Academic Board that there should be a university wide policy on integration of information management competencies into courses and curricula. These competencies should be based on the American College and Research Libraries competencies.[16] The success of implementing such a proposal will require a close working relationship between academic staff and support services such as the library.

In addition to working with the various schools and departments of The University of Queensland to integrate information literacy training into the undergraduate subjects, library staff have developed the Cyberschool. This project is aimed at secondary schools students, giving the future students of the university an opportunity to develop some information literacy skills before starting their studies here.

The Virtual School of Engineering, which is part of the Cyberschool, has been developed by librarians and staff from the School of Engineering. This program poses engineering problems for students in years 10 to 12 explore and develop problem solving skills. It also gives them some experience of finding and using technical literature.

Conclusion

The twentieth century has been characterised by an exponential growth in the volume and complexity of information. To meet the challenges of this new information age, the engineering profession, like all other professions must develop a new mindset which values information literacy and lifelong learning. Librarians and academics should seize this opportunity to forge new alliances and work towards the common goal of producing graduates who possess the necessary attributes to play a meaningful role in the information age.

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Appendix 1

Summary of evaluation of the first year program

1	strongly agree
2	agree
3	neutral/undecided
4	disagree
5	strongly disagree

Question 1
The webpage and classes have developed my skills in finding information

1	2	3	4	5	Average
21	172	106	59	18	3.64
6%	46%	28%	16%	5%	

Question 2
The webpage will be useful to me in successfully completing the group project

1	2	3	4	5	Average
49	195	87	38	7	2.36
13%	52%	23%	10%	2%	

Question 3
The webpage contained too much information

1	2	3	4	5	Average
5	21	138	170	42	3.59
1%	6%	37%	45%	11%	

Question 4
The information in the classes in the Library Training Room covered the kinds of sources that I need to complete my project

1	2	3	4	5	Average
20	157	144	46	9	2.65
5%	42%	38%	12%	2%	376

Question 5
The Bulletin Board was useful for discussing my topic

1	2	3	4	5	Average
20	60	153	98	45	3.23
5%	16%	41%	26%	12%	376

Question 6
Did you access the webpage from home or outside the Library?

yes	no	no answer
302	69	5
80%	18%	1%

Question 7
The level of difficulty of the quiz was:

very difficult	somewhat difficult	about right	Somewhat elementary	very elementary
12	21	155	100	80
3%	6%	42%	27%	22%

Question 8
As a result of the library classes and the webpage I now know how to: (you may tick more than one box):

No. of responses	%	Statement
310	82%	search the Library catalogue
255	68%	find books at the Kept At Desk (KAD)
220	59%	borrow books
224	60%	write a bibliography
189	50%	find books in the Reference collection
223	59%	use the databases

INTERNET SOURCES FOR LIFELONG LEARNING: A MODEL FOR INCORPORATING A WEB COMPONENT INTO A COURSE

Carole Duffill
University of Western Australia

Abstract *For the last three years the Library at the University of Western Australia has participated in a second/third year philosophy unit on social ethics. The course controller is concerned that students develop a critical approach both to evaluating information in the area as well as being able to locate it. In addition to having the skills and knowledge required to pass the unit, a major aim of this course is to help students gain general information literacy skills which they can apply in a broader social context. When these aims were combined with the course subject content, it became obvious that, as well as requiring a host of traditional bibliographic skills, Internet sources would be a significant information source. As a result, a partnership between the Library and the course controller was formed, not only to provide a traditional bibliographic component, but also to ensure that students knew how to search the Internet effectively and, most importantly, that they could evaluate the sources and information that they found there. This partnership was seen as providing a possible model which could be applied in other courses to support the University's plan to promote inquiry based learning. The component was considered to be extremely successful in 1997 and, on this basis, was run unchanged the next year with very disappointing results. In 1998 the course controller considered that the students gave little evidence of having developed a critical approach to evaluating information sources. The reference librarian also considered his contact with many of the students to be unsatisfactory and that they had not developed good information searching skills. Given this experience, the course was reviewed in 1999 and changes made. Why was there such a radical difference in results? What lessons can be learned from this experience? Has a useful model for integrating Internet skills and critical evaluation of sources now been developed?*

Like so many other universities, the University of Western Australia is committed to promoting inquiry based learning and the Library to supporting this philosophy through incorporating information literacy components in undergraduate courses. Unlike many of other universities however, this university has no foundation or compulsory units in the Arts and Science Faculties, nor does it have a tradition of providing time in units for library/bibliographic instruction or information searching components, to help students develop these skills.

The current information literacy program in the humanities and the social sciences is dependent on the goodwill or interest of individual academic staff who are prepared to provide time within their units for students to learn these information searching skills. As a result it is rather patchy.

Aims

The library component of the 2nd and 3rd year philosophy unit on social ethics was initially developed with two main aims

- The course controller wanted students in the unit would to have sufficient information searching skills to find their own information sources for the unit. He also wanted them to develop a critical approach to evaluating what they found and hoped that in attaining these skills he would provide them with one of the foundations for lifelong learning
- The librarians saw it as an opportunity to develop an instructional model which, if it could be shown to be effective, academic staff might be willing to incorporate into a range of undergraduate Arts and Social Sciences units.

Good news

The initial course was extremely successful. All involved were enthusiastic, student feedback was plentiful and positive and we felt we had an effective model. After three years the course controller is still committed to incorporating this component in his unit. He considers that the students have benefited from their participation and that the quality of their work has improved over these years. And, some students still provide positive informal feedback on the library sessions.

Bad news

The bad news or the *other* news, is that we are no longer confident that we have found a useful model. Further, it has raised some fundamental issues about the librarian's role and ability in assisting today's undergraduates in the humanities and social sciences to become information literate.

Changes

In response to our experience with the course last year, we changed its organisation and some of the content this year and intend even more radical changes next year.

Course outline

1997/1998

The course was divided into two one hour sessions. Students were expected to attend both sessions which were scheduled during tutorial periods and held in the library training room. Here they had access to computers with the library's information network (CygNET) either individually or in pairs. An experienced reference librarian who is a very competent instructor, gave the sessions.

The first session covered the Internet – its content, searching techniques and, most importantly, evaluating sites and documents. The second session dealt with topic analysis, locating periodical literature and developing database searching profiles and skills.

For the first two years students took away a small practical exercise to complete after each session to reinforce what they had learnt. They had then to attach these exercises to their essay to show that they had done this work. The course controller subsequently discussed the sessions informally with the students and the library instructor. From this feedback, from reviewing their exercises and from their bibliographies as well as the quality of their assignments, he gained some indication of the sessions' effectiveness. A small percentage of the course mark was allocated to work done in the session.

Questions and comments from students doing the exercises and assignment also provided the reference librarians with feedback on the sessions.

1999

This year the order of the sessions was reversed. The exercises were expanded a little and they were marked by the instructor and subsequently passed to the course controller. Ten per cent of the course marks were allotted to this component of the course. As in previous years, students were encouraged to contact the library instructor for any additional assistance or clarification after the sessions.

At the beginning of each session the instructor briefly outlined its purpose and content. Students were then shown the exercise they would have to complete subsequently and reminded that the results formed part of their assessment. He then provided them with the option of remaining for the session or, if they felt competent to do so, leaving and taking their exercise to do on their own. A few students took this option, while some who had indicated that they already knew the content that been outlined for the session, opted to remain once they saw the exercise.

2000

While the content of the course will remain substantially the same, its emphasis will be different. There will be one longer session which will take place in the two weeks prior to the students' major assignment. It will be run jointly by the course controller and the library instructor.

The course controller will discuss analysing the question and indicate how the sources found relate to it. He will provide students with the language and concepts required for information searching. He will also be able to comment on the sources they find and their relevance, and recommend which links or references may be worthwhile pursuing. He will reinforce why and how the information found relates to the topic and its implications.

The library instructor will support what he says by teaching students how to access sources as they move along the continuum of information searching. He will show and discuss with them some mechanisms and techniques for evaluating web sources within the intellectual framework established by the course controller.

Both the librarian and the lecturer will provide intellectual and technical input in the session. The students should be able to recognise the different expertise of both people and yet will be learning to find and to evaluate information in a seamless and systematic way.

Issues and problems

I already know it

In 1997 the Internet was still new to many students. They were keen to learn how to search it and gave their complete attention to everything that the instructor had to say about it. Instructions on how to find sites and what sort of information could be located were followed with interest, while the news that perhaps everything that was found should not be accepted uncritically was, to some of them, a revelation. A methodology which they could use to help them assess sites and documents was applied with interest.

By 1998 most participants were familiar with using the Internet and thought they knew how to search it. They could not understand why the needed a session about it. They were not interested in learning how to search it better because they were satisfied with the way they searched. They knew that they could find what they wanted when they searched. This attitude then flowed over into the segment on evaluating sites and they just did not pay attention to what was being said. Confident in their abilities, some in the group started doing their own searching and following their own links rather than those suggested by the instructor. They claimed that they knew it already, or began to work their way through their exercise, while others became disruptive.

The course controller was subsequently very disappointed with the quality of the work from the 1998 group compared with that of 1997, and he told them so. He commented particularly on their lack of critical assessment of the material that they had found on the Internet.

I have already had library sessions

In the last couple of years some students did not come to one or both sessions because they had already attended *library classes* in another unit. Some then subsequently sought individual assistance with the reference librarian to go over the material covered in the library sessions because they found that they could not complete the library exercises or did not in fact, know what was covered in these sessions. Others sought no subsequent assistance and the quality of their assignment bore witness to their lack of information searching skills.

What is so special about being here?

The training room is formed by sectioning off some of the area containing the CygNET work stations with glass partitioning. When not used as a training room the area is open so that students are used to working there. Although just adequate as a training facility, most participants in the sessions run in the area would feel crowded. They can be easily disturbed by seeing or hearing activity outside the room and there is no where inside to sit comfortably, to take notes or to work in groups or alone without disturbing others in the room.

In this situation it is very hard for the instructor to establish and to maintain an atmosphere for the students that the sessions are something special, that they need to pay attention, and that they will benefit from being there. Many of today's students associate the value of something with the quality of its presentation and the environment in which an activity occurs. If they are in a second rate situation, then by inference what they are involved in is second rate, or at least of no special value. If they are to value and to pay attention to what they are to be shown, then it has to be done in an environment which encourages this. They have to feel that this is something different, something special. Sessions in this training room do not automatically evoke this feeling.

What do you know about this subject?

The library instructor was well prepared for these sessions. He was an experienced reference librarian who had discussed the course, the examples, and the assignment topics with the course controller. He had an arts background and was personally interested in aspects of the subject. He did not however, have any subject expertise or qualifications in philosophy. He could show students a systematic approach to information searching in the subject. He could answer technical questions about the Internet and database searching as well as give informed comment on some aspects of the topic and, he could illustrate many points with *approved* subject examples.

However, the students did not see him as a subject expert. He could not bring to their attention important names when scanning databases; nor could he provide expert comment on sources and opinions. Students posing *simple* subject questions in the sessions were referred to their lecturer for the answer.

When students consider that their instructor knows no more than they do about their subject and that they already have the technical expertise on which they think the session is focusing, it can be, and in this case sometimes was, difficult for the library instructor to establish credibility and thus, to gain their attention and interest. There was not the same attitude in library sessions in the pre computer age when the presentation of printed sources, with which students were totally unfamiliar, usually gave the librarian the aura of subject expertise.

I do not know what topic I am going to do yet

The sessions were premised on the assumption that students had chosen their essay topic and had spent some time thinking and reading about it. They would then see how the content of the library sessions related to this assignment, at the very minimum, and that the sites and references found in the exercises would form part of the basis for their essay.

This was not always the case, so that many of these students could not see the direct relevance of what they were being taught which affected both the attention they gave to the instructor and their retention of the sessions' content. This year some students even turned in library exercises and essays on different topics.

Not knowing before they came to the session what essay they would do increased the students' difficulty in starting their exercise by analysing their topic and developing a useful search strategy for it. They had no subject framework in which to work or sufficient relevant terms which they could use for computer searching. Reference librarians had already noticed the increasingly common difficulty that many undergraduates have in finding material for assignments because of these problems. Many do not know how to analyse their questions or have not done so before they begin to search for information, and thus they lack the terminology to develop effective profiles for computer searching.

Some of the students who had not prepared for the session, expected that the library instructor would be able to provide them with the subject background that they lacked. When this was not the situation it affected their view of the expertise that was on offer.

I have been to the first library session for this unit and knew it all, so why come to the second?

Some students could not understand why they needed to come to two sessions. So some of them did not. This was particularly the case if they felt that they already knew what had been covered in the first session that they attended. The order of the sessions was changed this year in an attempt to overcome this as it is now considered that many students feel less familiar with databases than they do with the Internet.

It is not coming up on my computer

There is always an element of danger teaching live, in this case with eight CygNET work stations, and the instructor is fortunate indeed, when the students' computers perform like synchronised swimmers. But, students need to experience the real situation and to learn by doing, if at all possible. Different results and responses provide excellent teaching opportunities, but only if they can be managed and kept within an acceptable time frame.

It was difficult to maintain the interest and attention of the students when response times were very slow, or when sites or databases could not be accessed at all when required. Such problems detracted from the librarian's credibility and made the sessions appear rather amateurish and the equipment second rate. Moving students in a small space to crowd around computers that *worked* was quite disruptive and not all that effective, while suggesting that they access the sites on their own afterwards left many of them uncertain about what do.

New course

The new course will address only some of the issues that have been identified. The limitations of the training room and the uncertainty of reliable access to computer sites when required, will remain. However, having identified these as important issues, solutions or improvements are being considered as part of the overall long term plan for developing improved resources for the information literacy program. In the short term, we will try and develop ways of dealing with the situation better and have contingency plans.

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The dates of the sessions will shift so that they immediately precede the major essay and occur within a framework which provides students with an understanding of their topics. Topic analysis and searching will occur together and this interaction should enrich the students understanding of issues and their ability to ask the right questions and to evaluate what they have found. This team teaching should reinforce the credibility of both the lecturer and the library instructor as they interact with each other and each has a specific *expert* role.

From the students' perspective the session will be part of their normal course lectures and tutorials. The only difference is that one of them will be held in a different venue, the library. In the course outline the content of this session will not be 'differentiated' from that of the rest of the course.

CygNET provides a seamless interface to information. Many students do not and cannot readily distinguish between the sort of material they are finding. Internet sites, full text materials, course lectures, references in the catalogue or those found on databases are all the same to them. Their response to a question about where they found an item or what they were searching is often on CygNET or on the computer or on the web or to provide the name of a database vendor. So, presenting information searching in a deconstructed manner, as we librarians view it, does not relate to their experience of information searching, and describing the content of library sessions according to sources, conveys very little to many of them, particularly before they have been to the sessions.

In the new course we will try teaching information searching skills from this perspective so that we go with the students' perceptions and try to make use of their existing skills, knowledge and their conceptual framework rather than try and impose the more traditional models of information searching. The evaluation of the web sites will be integrated into the bibliography of the essay and form part of its assessment rather than be done as a separate exercise.

A new model?

Of course we would hope that the session will be a success. We hope that students will be able to apply what they have learned in the short term as well as to apply these new skills and techniques in other units and that it will to give them a basis for lifelong learning. In reality, we can expect the range of success to vary, but we should also expect that every student learns something useful from the session.

Evaluating the success of the session will be done in a range of ways using individual informal student comments and feedback, the impressions of both the librarian and course controller, the quality of the essays and bibliographies and the formal student feedback on the course which is sought at the end of the unit.
However, even if it is very successful, it is unlikely that the new session will function as a general model for incorporating library instruction in other units. Basically, it would require more commitment and time from academic staff than most of them could or would likely be prepared to give in their unit for their students to acquire subject analysis and information searching skills. And it is probably too labour intensive for the library and would not work for units with large enrolments and a multiplicity of tutors whose subject skills, knowledge and instructional abilities can vary widely.

New ideas

Although probably not a model for other courses, the issues raised from the intense scrutiny we have given this course will affect the organisation of our general information literacy program and in particular, the way we teach searching the Internet and evaluating what is found.

The issues raised in this course are not unique to this course and there are a variety of responses to them. For us, perhaps the most useful outcome has been that we have discussed and reviewed and had to recognise changes in the expectations and skills and knowledge of our undergraduates, the way that they look for information and their perceptions of the expertise and role of the librarian.

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THE DREAM STUDENT ... A CASE STUDY OF AN INFORMATION LITERACY MODEL FOR HIGHER EDUCATION

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Abstract *At Christchurch Polytechnic library staff had known for some time that there was a gap between the subject tutors' perception of the students' information retrieval skills and the reality. Tutors would request bookings stating that the students needed to learn about research in the library and would only need an hour. Also during orientations on the students' first day at the Polytechnic, a day that for many students passes as a blur, we were expected to teach them all about the library. Meetings between Library staff involved in Information Skills and Learning Services staff identified the need to change our practices in order to provide a more stream lined and consistent approach that would benefit the students. As part of these changes we needed to look at what other institutions were doing in this area and what the professional literature in the library and education fields had to say on the topic.*

Background

Library staff teaching databases sessions often found that the students, who only turned up if the session was during their standard lecture times, had no idea why they were there or how the session fitted in to the rest of their subject course. Database search skills are easier to learn in the context of a real information need. However students often did not understand their assignment question. Also students were not aware of the type, nature or volume of information required to answer that question. At the other end of the process were the students who did not know what to do with the information once they had located it. Often students would be so relieved to find something on their topic that no evaluation took place.

Our colleagues in Learning Services (located on level two in the same building) were often picking up the pieces at each end of the information gathering process. An upstairs downstairs approach to assignments was taking place. Students would go to Learning Services for assistance in deciding what the assignment was asking them to do, then go to Library staff to find information for the assignment, and then go back to Learning Services for assistance in essay or report writing.

But what is it called?

What we went searching for was a term or concept that described all the skills that the students required. We had already done some preliminary readings about this thing called 'information literacy' but had been unable to pin down a definition of the term and therefore a related set of skills. We also needed a definition that would inform course content, aims and outcomes to ensure credibility of the course within the framework of courses taught at Christchurch Polytechnic.

Within the literature, there were three predominant terms used, user education, bibliographic instruction and information literacy. As part of my upgrade to the Masters in Library and Information Studies I undertook an extended critical essay that focused on the differences between, and the uses of, these terms.[1] A preliminary perusal of the literature revealed that there was little consistency in the use of these terms. Within the literature these terms are used as if they are interchangeable ways of describing a common concept. Further investigation of the literature reveals that these terms describe very different, though connected, processes. That there is no consistent definition for the terms information literacy, user education and bibliographic instruction is the subject of numerous articles. Each article tends to conclude with yet another definition to add to the melting pot. Each term did appear to have its place in the activities of the library profession.

Bibliographic instruction, with its subject tool focus, is an important part of getting students started in their search for information. A number of teaching models is based on the assumption that relevance is an important aspect with regard to learning. Bibliographic instruction meets this need. What could be more relevant to a student, than teaching them how to use the particular database that will provide them with the required information for a particular assignment? Teaching students how to use a particular information tool forms a basis for the transfer of skills to another information need.

User education has so many parts that to discontinue it would be a disaster. The indirect forms of user education, such as, signage, database manuals and subject guides are an essential part of library services. User education represents everything librarians do to assist their users to make best use of library resources. Bibliographic instruction forms part of many user education programmes. Both user education and bibliographic instruction are part of information literacy, the library part. Without becoming complacent, librarians need to acknowledge that what they have been doing has, for the most part, fitted the needs of their clients. Changes in technology have allowed for the development of new resources and enabled the inclusion of creative options with regard to teaching techniques.

What we concluded was that the future of any form of library instruction is dependent on the consistent and correct usage of the terms user education, bibliographic instruction and information literacy. Models of information seeking behaviour provide a theoretical background for the planning of teaching sessions. Library instruction sessions of any type should be planned with clearly defined and measurable aims and objectives. All three terms, when used correctly, form part of the essence of library work. It is essential, however, that the philosophical differences between the terms are recognised and that these differences are not seen as mere semantics.

We concluded that information literacy best described that set of skills that we want to teach our students. The next step was to select a definition of the term that we could use in our course outlines and that would be meaningful to other parts of the polytechnic. We discovered that 'trying to give a precise definition (to information literacy)... is like trying to swim through treacle'.[2] The American Library Association Presidential Committee on Information Literacy[3] developed the definition 'to be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information…'

In the end we adapted the definitions of information literacy to suit our learning environment. The impact of the definition was to change the way in which Learning Services and Library staff approach our contribution to the students' experience at Christchurch Polytechnic. The definition of information literacy gave clear directions that in order to claim to teach information literacy we had to ensure that the student was taught all aspects of the information literacy process.

How was this to be implemented?

In 1996, a committee designated to study strategies for implementing specific generic skills into the curriculum, decided to add to the profile of a Christchurch Polytechnic graduate, the descriptor of information literate. Besides the tangible outcomes of knowledge, skills and attitudes relating to specific subjects, a graduate requires skills for lifelong learning, namely the ability to assess the need for information, to access that information, evaluate it according to need and to apply it critically.

The Education Resource Centre charged itself with the responsibility of putting substance to this concept by providing the pathway to independence for our dream student.

What does this mean for teaching?

The shift towards transferable skills means a move away from technical skills to a conceptual framework as a basis for teaching. Both Learning Services and Library staff have skills and expertise to offer in the delivery of information literacy. It seemed only sensible that we combine these in the delivery of these sessions and so team teaching was the model that we adopted. This means that a Learning Services tutor and a Librarian teach each course or session. Library staff still run some 'database sessions' and Learning Services still offers sessions related solely to their content area. However these sessions are taught within an information literacy framework and the other components of the process are discussed. For database sessions this can take the form of ensuring that the students understand their assignment question and where relevant have decided on a topic prior to coming to the library.

Joint teaching seems to give credibility to the courses taught and the appointment of an information literacy Coordinator from within the Learning Services staff has ensured adoption of our course across the range of subject programs taught at the polytechnic.

Research backs up our decision. Julien's[4] study of New Zealand libraries delivering information literacy sessions showed that librarians draw a line between the skills that should be covered by library staff and those for which they should take partial or no responsibility. This study highlighted the differences between the librarian's definition of the term information literacy and the actual content of their information literacy sessions.

Although 92 per cent of respondents thought that the ability to critically analyse and evaluate information was part of information literacy, 68.4 per cent believed that librarians should take only partial responsibility for this area with 18.4 per cent stating librarians should take no responsibility. Recognising when information is needed is one of the first steps in many information literacy models. Julien's study found that 65.8 per cent believed librarians should take a partial role in this skill and 21.1 per cent were in favour of librarians taking no responsibility. Although the literature states that critical thinking skills are part of user education, bibliographic instruction and information literacy, only 35 per cent of the respondents see these skills as an element of information literacy. Their responses were evenly divided between those who thought librarians should have no responsibility and those who believed they should take partial responsibility for teaching this skill. The more recent of the two studies reveals that librarians are still stating that the teaching of non library skill areas is not totally their responsibility. These skill areas are key elements of the majority of definitions of information literacy. They are what separates information literacy from user education or bibliographic instruction. It is of note that as librarians, we are pushing for our students to become information literate yet we are not teaching all the skills involved. Literature related to information literacy focuses little attention on the role of other experts, such as subject tutors, in providing some of the skills that make up information literacy.

The teaching team

An information literacy team was organised from across the Education Resource Centre Division. The core team which is responsible for the strategic direction comprises the coordinator (a learning developer), the Information Skills librarian, the librarian and a branch librarian and a staff developer. A teaching team of three learning developers and four librarians is responsible for the delivery of courses. In 1999, 709 hours of information skills will have been taught in 26 different programs. The factor critical to this is the role of ERCQIST – the Education Resource Centre Quality Improvement Support Team – rather clumsy nomenclature but nevertheless a very effective way of ensuring that information skills are included in all programs which incorporate resource based learning. This team assesses all existing programs being reapproved on a three yearly cycle and monitors all new programs. It is now an integrated part of the quality assurance process and acts as an auditor before programs are approved or accredited.

The concept

Our model which can be described as prescriptive contains 12 steps. The aim is to enable students to develop skills to access, evaluate and manage information for assignments. The model seeks to facilitate this outcome. Most steps are self explanatory. The final step relates to evaluating the feedback from the marked assignment with the purpose of identifying areas of weakness and rectifying these.

The format varies according to whether it is credit bearing or an integrated part of a host course which is supporting a course specific assignment.

A stand alone information skills course may be taught as an 18 hour, three day block course or a three hour session for six weeks or two hours for nine weeks. Content will include any or all of the following topics

- successful learning
- information analysis
- information organisation
- information evaluation
- academic writing conventions
- referencing
- electronic resources

The course is delivered on site and by distance in print form. This 18 hour course is currently delivered to the pre health and nursing transition as a prerequisite. It is delivered in the Bachelor of Design as one of two compulsory courses for all three streams.

Flexible modes of delivery

As part of the Christchurch Polytechnic's objectives to provide flexible ways for students to learn and study, the transfer of our distance Information Skills course from paper to web based has recently been undertaken. The paper based package was totally revised as part of this process. This course is taught to nursing transition students, these being enrolled or registered nurses who need to transition to degree status. Our information skills package is a prerequisite for these students to be able to enroll in the transition papers. The student profile is predominately that of mature women who are working full time and have out of work commitments. The students have often not studied or written essays for a number of years and some have never written an essay before. Although some students may be using computers as part of their work, on the whole computer skills are basic. The students are scattered throughout the country and are often in isolated rural areas with little in the way of computer support services. They also tend to only have one phone line so it is impossible to talk them through an Internet problem over the phone.

When researching part of this project, I discovered a number of really impressive online tutorials for database searching and evaluation skills. However some of these packages were slow to load or required me to download application.

The design of this online package was based on the following criteria

- the pages had to be quick to load
- it did not require the student to download any applications
- the pages were easy to printout
- the pages could be easily book marked
- the information skills process was apparent at all times
- although there was a preferred sequential order the students could work through the steps in any order
- the pages were clean and easy to read.

Some of the features that we were able to enhance as part of the redevelopment of this package are

- feedback from students via email (it is not always agreeable to contact students during their work hours)
- feedback to students regarding their progress via worksheets created as online forms
- the ability of the students to access the library's databases via the internet.

The package is available at the following address until the end of 1999, after which time it will be password protected [http://courseweb.chchpoly.ac.nz:8084/cssk400].

Issues

The issues associated with such a course are ones you may all have experienced: the student profile, contextual and discipline specific examples; recognition of prior learning without setting the students up for failure or allowing them to self assess when they often do not know what they do not know; confidence and competence in computer literacy; the clarity or more often the lack of it, in assignment instructions and marking guides.

Academic writing continues to provide a challenge. The teaching of discursive writing, objectivity and critiquing are all issues we grapple with.

A factor significant to the effectiveness of the delivery though not always practicable is the team teaching of a learning services tutor and a librarian. It has proven professionally developmental for each party as the respective skills and expertise are exchanged to the benefit of the student. It models the integration of the steps within the framework. The students appear indifferent to whether they are being taught by a tutor or a librarian. The mix of professions has brought a seamlessness which has benefited both the students and the teachers. All librarians on the team have completed or are in the process of completing a Certificate in Adult Teaching qualification.

A critical factor is coinciding with the learning moment, when the student perceives the need to acquire the skills as they appreciate this process will benefit their learning and facilitate the outcome, namely a passed assignment. Tension exists here, as the host program may well prefer the timing to be dictated by the expediency of their timetable, rather than the more educationally sound but often less practicable dictates of the learning need. The challenge for us it to assist the student to understand information literacy is an integral part of their learning process and not an add on.

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Assessment
Again this will vary depending on the graduate profile and level of the host program but may include within formative assessment

- subject specific worksheets relating to analysis of assignment instructions
- use of electronic resources
- evaluation of information
- summarising and paraphrasing
- referencing.

Summative assessment will also vary. Where the program requires essay writing skills as in for example, the pre-entry course to Nursing, a typical essay instruction would be

Choose a health related topic of interest. Identify and discuss the issues implicit in this. Select two and discuss these

A more generic piece of assessment to meet the same learning outcomes would be

Choose a subject related topic. Select three pieces of information relevant to your topic. One piece is to be from the library catalogue and one from a journal database and one from the Internet. Write an assignment which includes

- *the topic selected*
- *the steps of your search procedures*
- *an evaluation of the information using at least 5 criteria*
- *a reference list / bibliography of the 3 pieces of information.*

The design of the assessment while required to match the learning outcomes must focus on the assessment of the students' ability to demonstrate an understanding of the process, as opposed to the subject content. This is often a new experience for the student and can engender some angst. A cause for concern has been the need to fail some students which of course is not conducive to good public relations when the underpinning aim of information literacy is to enable the student to acquire the skills for lifelong learning.

The institutional quality system requires a rigorous moderation process where each assessment must be moderated for clarity of instruction, for compliance with the learning outcomes and for a fair and valid marking guide. Examples of each grade and all failed assignments are then marked internally and moderated by a nominated external moderator, usually from the host faculty.

That information literacy is about a process more than content poses issues for assessment. To be effectively information literate, one must continue to practise and update and integrate the behaviors so assessment at any one point is valid only for that particular task and time. Assessing the students' ability to transfer the skills is equally as problematic.

Evaluation
Each course is evaluated for the appropriateness of the length, the usefulness of the content, the effectiveness of the teaching, the effectiveness of the content in preparing the student for further learning. Suggestions for improvement are requested and the moderation process requires that these suggestions be debated and acted on as appropriate.

Naturally issues arise from the delivery of such a course where the focus is on process rather than content. It is critical that the examples and any assessment be subject specific.

Recognition of prior learning (RPL) has proven to be one of the most fraught issues, as students may believe they are competent but are ignorant of their ignorance. Pre testing was trialed at the insistence of the tutor in a language degree. Most students failed dismally and we felt responsible for contributing to setting them up for failure. So ethically and educationally this was most undesirable. The option of web delivery and self paced learning may alleviate this dilemma. Pitching the learning at an appropriate level is synonymous with the RPL issue. One barrier which is lessening with time is lack of information technology experience. Each year, more and more students are computer literate and this no longer constitutes the major barrier to learning it once did.

The concern lingers, the doubt nags – how do we really know we have produced an information literate person? Will this student transfer these skills? Have we misguidedly perpetuated the bête noire of generic skills by decontextualising them?

Now what? The challenge and the conundrum

We are placing much faith in the competency standards for the resolution of our dilemmas relating to assessment and evaluation and ensuring the transferability of the skills.

Our information literacy program can be and has been criticised. It has flaws which we acknowledge. However we have a modicum of satisfaction regarding its acceptance to date by our community.

Information literacy has been established in our institution and this has been driven by a team of committed people dedicated to the philosophy that teaching is the facilitation of learning and that the responsibility of a learning organisation is to provide its graduates with the ability to access, evaluate and manage information.

It has become increasingly apparent that the Information Skills courses have captured the imagination of our academic staff to the extent that we are in the situation of demand exceeding supply. With clear messages of budget restrictions, we took this dilemma to the faculties who endorsed the suggestions that training be targeted to academic staff with a view to integration of the skills.

We believe that information literacy, as a generic skill should be integrated into the curriculum. We are teaching the students but now our challenge is to teach the teachers. To use new age theory vernacular, we believe we must let go our hold on information literacy. It must not be just the domain of the librarians. Educators must take on this concept. How scary is that? This provides a great challenge to our sense of professionalism. How do we maintain quality, accountability, credibility, integrity?

Who owns the knowledge? If we are knowledge brokers, to whom do we broker? This is the conundrum.

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TOO EASY – *WEB-EZY*: AN INTERACTIVE LIBRARY SKILLS PACKAGE

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Abstract *In recognition of many of the limitations of current products and the realisation that these often attract too few resources, a joint project has been funded by UNILINC and Charles Sturt University (CSU). A shell, known as Web-ezy, is being developed for the delivery of library skills and information literacy training. This will enable customisation by purchasers to suit their own needs. Using this approach, UNILINC and CSU will tackle major issues associated with such library products, such as replacing extensive amounts of text with well designed graphics, developing pedagogically driven interactive elements and undertaking ongoing maintenance and support of the product as the environment alters. Producing high quality, well designed web based materials can be a long and expensive exercise, possibly thankless and never ending. Nowhere is this more evident than in library skills and information literacy training products. This paper will examine the state of the art in web based interactive tutorials for developing library skills and information literacy. Examples will be used to illustrate design and development considerations including screen design, interactivity, instructional approaches and maintenance.*

Introduction

On reflection the title of this paper is wrong. Instead of *Too easy – Web-ezy* it should probably have been *Not nearly as difficult*: *Web-ezy*. This does not have quite the same ring to it but is a bit more accurate. Anyone who has been involved in developing computer based training (CBT) or web based training programs will appreciate the complexities involved. *Web-ezy* is a shell that can be used to develop a customised interactive web based library skills program. As such, its distinguishing features are

- an attractive, pedagogically sound interface accessible by current web browsers
- high quality graphics
- generic content
- companion software that facilitates easy customisation
- variety of activities designed to take the user through structured learning
- presentation features to assist novice users
- high levels of interactivity
- assessment and quizzes
- provision for development and support on an ongoing basis.

The development of this product is a joint undertaking between Charles Sturt University and UNILINC Ltd. The UNILINC contribution comes from reserves built up over the years. Charles Sturt University has provided intellectual property and considerable amounts of high level staff input. Both organisations recognise the importance of online learning to the competitiveness of Australian teaching institutions and view this project as an opportunity to assist libraries in their endeavours.

A team has been put together that recognises the complexities involved in developing a web based training environment and the skills needed. The joint approach aims to get around problems with inhouse developments whereby the costs involved in initial development and ongoing support and the available timelines often conspire to produce results that lack the impact and longevity desired. Examining these points in turn.

Skills needed

The development of a quality web based training program requires

- subject expertise; in our case, librarian input
- clear communication skills
- instructional design knowledge ie presentation on a computer screen of a program that teaches the user the required skills and knowledge

- graphic design skills; a necessary element in a world where everyone is incessantly exposed to high quality images. The surest way to kill interest is to have poor quality graphics and a preponderance of text. This is a major challenge in designing library programs
- legal skills and advice; a definite must with respect to intellectual property and related issues, especially when dealing with framed web sites
- programming skills
    - to ensure secure access to the program and licensed databases
    - to provide for interactivity
    - to enable data capture. Data is needed for evaluation and continuous improvement of the program; also for assessment, which will likely be self assessment and formative or summative
    - to improve learning outcomes. For example, at the point of discovery, enabling the student who has located an item of interest to easily record the results for future use
    - to ease complications in the environment. Many institutions have developed web based training programs using plug ins eg Shockwave, Realaudio, Realvideo. For novices, especially those at a distance, what could be more daunting than to have to locate, download and install one or more plug ins?
- project management skills which are essential for maintaining timelines within the group and working within budget limits.

Costs and timelines

With such a range of skills, there is the need for a team. Obviously this will not be cheap. Projects with which I am familiar have often cost in excess of $100,000. In addition, too often timelines blow out because individuals in the project team are spread too thin. What sounds like a good idea at the time fails to be recognised as a major commitment. The end result is that projects are abandoned, are out of date by the time they are delivered, and are rarely kept current or enhanced. Keeping the necessary staff within the organisation both available and focussed on the project over time, given turnover and competing priorities, is a major challenge.

Having pointed out some of the pitfalls, why would any of us undertake such projects?

With changes in global education markets, all institutions are being challenged to deliver their courses and programs online and/or provide students with access to online information resources. This is a trend that will only increase.

Equally certain is that, for the reasons mentioned above, libraries will have increasing difficulty attracting the large funds needed to develop their own web based interactive training programs. The solution has been *Web-ezy*.

Web-ezy

This program has been designed from the ground up to cater for a range of institutions. Initially we are concentrating on academic libraries. As revealed in the Open Learning Library and Information Service (OLLIS) project on which I worked, institutions understandably want *their* catalogue and *their* databases displayed and taught. Recent changes have seen enabling technologies emerge in the form of web based catalogues and database interfaces. When everyone had telnet screens, the workload involved in reproducing and simulating interactions was enormous. Today, with the ability to construct live links and with *Html 4* making screen reproductions easier, this barrier has been reduced significantly.

What we have available for this conference is the first appearance of *Web-ezy* at the stage of its development. Progress with the development of the first release has been rapid and continues as I speak. We plan to deliver a workable version to the marketplace in time for institutions contemplating a web based training skills program to implement by Semester 1, 2000. The functionality within *Web-ezy* can be seen from the demonstration on the web page at [http://www.unilinc.edu.au/web-ezy].

There are several modules, designed using a structured learning approach, to take users from an assignment topic, through a topic analysis to a range of searches in the library's web based catalogue. They then move to the Ovid databases and finally to search on the Internet. Included is basic navigation of a library's web site, plus evaluation and referencing. The Ovid system was chosen for the first release because most universities in Australia use Ovid for at least one database, *Current contents*, and because of the ability to write jumpstart URLs to any point in a database.

Topic analysis module

In the top frame, you see a graphic summarising the process taught to the students (Figure 1). They perform exercises that identify the various elements in topic analysis, either using radio buttons or 'on mouseover' scripting. These approaches are also used in the modules dealing with citations and referencing. The student makes a selection and obtains feedback.

Some of the screen design elements include

- in the top right corner, extending over the toolbar area, is the feedback area. This area is also used to present users with the details of a search they are undertaking (Figure 2)
- the left hand frame – the ever present navigation frame – is kept to a minimum through the use of icons. A user seeking an explanation of an icon will use the 'on mouseover' feature. This frame is further utilised to incorporate institutional badging in the top of the frame. A discrete *Web-ezy* logo appears at the bottom
- by virtue of the frame layout and feedback/search box, the screen display area is maximised and thus scrolling is minimised. To this end, the generic content delivered with the product and appearing in the instructional frame has been heavily scrutinised
- the upper frame is used to display the object of the instructional frame – the catalogue, Ovid screen or web page. If it is preferred that the location of these be reversed, that option is available, as are options for background colours for the instructional and the navigation frames. These are all defined in a workbook completed by individual institutions.

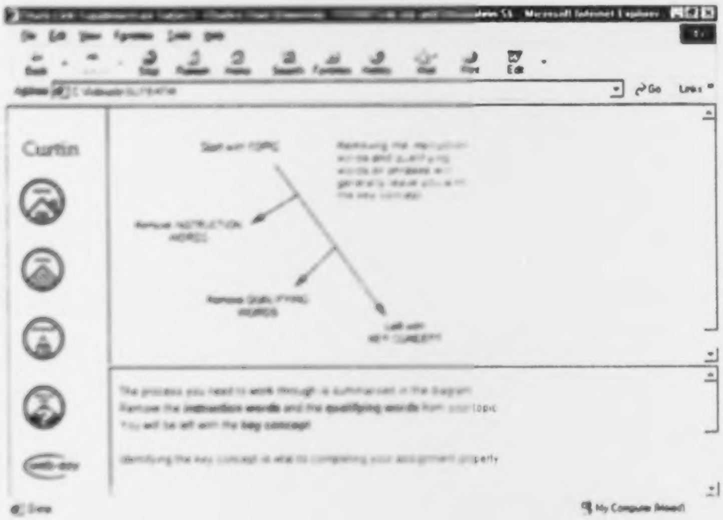

Figure 1

The catalogue modules

How is keyword searching handled? Figure 2 has an institution's web catalogue displayed in the top frame, instructional material in the bottom frame and an activity which requires the student to record the location and call number in the box provided. Assessment of the input is done using javascript. We purposely avoided the use of options such as Shockwave and Realvideo as these can cause major difficulties for users, requiring them to have the expertise to locate, download and install plug ins.

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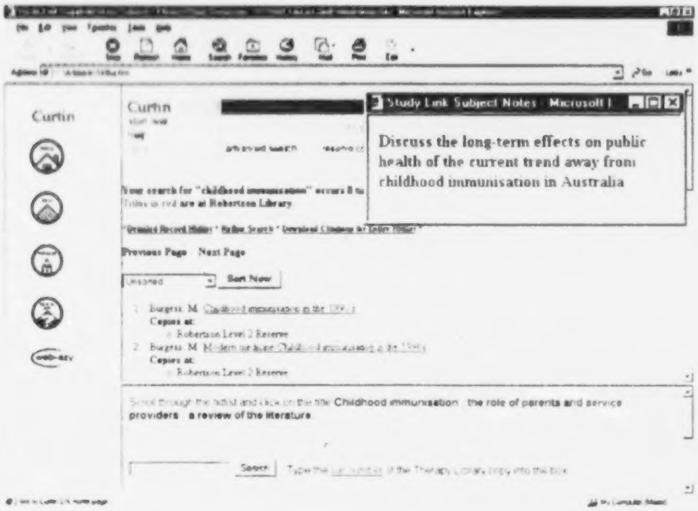

Study Link Subject Notes : Microsoft I

Discuss the long-term effects on public health of the current trend away from childhood immunisation in Australia

Scroll through the hitlist and click on the title Childhood immunisation : the role of parents and service providers : a review of the literature

Figure 2

Wherever practicable, the activities represent the real life situation as closely as possible. For example, in using a catalogue in the library you record the call number and location of the item. The only difference in the *Web-ezy* program is that you type it. In keeping with this instructional philosophy, we developed a Notepad feature, something the development team believes sets this product apart from similar programs.

One of the icons in the navigation frame is the notepad. At any time, users can call up the notepad, and record either by copying and pasting or by typing, items of use, something they have learnt or make notes and ultimately email or save the notepad file. In developing *Web-ezy*, we sought to get away from the all too common situation with training programs, where students have to work their way through the material and finally try to recall what has been taught in applying it to their assignment topic. For larger programs, several hours work may be involved on the training program itself, before students have a chance to start on their actual assignment. With *Web-ezy*, they can be working on the assignment within the program, applying immediately what has been taught. Further, the notepad allows the results of resource discovery on their own topic to be easily recorded for later use.

In teaching techniques for searching Ovid databases, we have used a mix of captured screens and live URLs using Ovid's jumpstart feature, depending upon whether feedback is required or not. The program content covers development of a search strategy, teaching the basic skills necessary to use a full text Ovid database. Here, we expect that libraries will choose different examples. Customisation of the product can be either as little or as much as desired. It will be delivered with the necessary links to your library's web catalogue and Ovid databases, using a standard suite of examples but displaying the results applying to your institution. A workbook is completed at each installation site in order to enable the necessary changes to be made. Increased customisation involves the institution purchasing a third party companion product, *easyHTML* or *FrontPage 2000*. This enables customisation of the text appearing in instruction and feedback/search windows (see Figures 1 and 2). Changing examples that appear as either live URLs or captured screens is a little more complex, involving a greater knowledge of HTML and frames.

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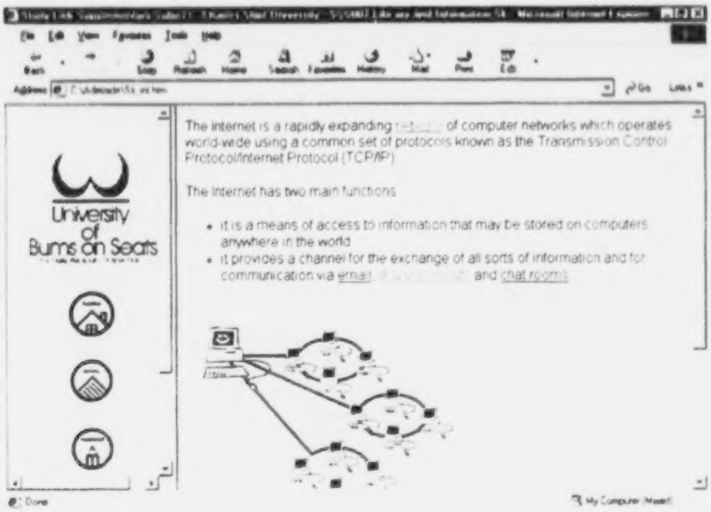

The internet is a rapidly expanding network of computer networks which operates world-wide using a common set of protocols known as the Transmission Control Protocol/Internet Protocol (TCP/IP)

The Internet has two main functions

- it is a means of access to information that may be stored on computers anywhere in the world
- it provides a channel for the exchange of all sorts of information and for communication via email, [illegible] and chat rooms

Figure 3

The modules dealing with the Internet are designed, in the first release, to cover the basic topics: what is the Internet, its role as a study resource, how to use a search engine/directory and the basics of information evaluation along with the features already mentioned ie javascripting to provide feedback, use of the notepad, the ability to tackle their own assignments, simple queries to check understanding. Figure 3 is a sample screen showing an animated giff depicting the Internet.

I have mentioned the use of a structured learning model. Each module commences with some introductory material. The student is then taken sequentially through the task at hand receiving feedback from the various exercises. They are gradually released as they gain confidence, to the extent that a number of modules conclude with them being able to search on a topic of their own. The development team felt very strongly that *Web-ezy* should assist students to work through their own topic at a point where they have learned new skills and can benefit, in more ways than one, from immediate application. Not only is this excellent reinforcement but also allows the student to be progressing towards a piece of assessment as they work through the *Web-ezy* content. To this end, and with its easy to use notepad feature, *Web-ezy* is unlike any other library skills program of which we are aware.

Behind the front end, there are important server features. A server is necessary and, because of the need to authenticate access to database and other licences, should already be available in academic libraries. A mechanism has been developed which allows users to be returned to the point at which they exit the program. This was deemed essential, given that the program will rarely, if ever, be completed in a single session. This makes it easy for students to use the program in a self paced way, leave it when they need, and resume at that point at a future time. It is also possible to gather data, either for assessment purposes or to assist with future instructional design. Results captured can be downloaded to Access or Excel for manipulation.

Future plans

We are on schedule to implement several sites for Semester 1, 2000. In the first release, *Web-ezy1*, priority will be given to libraries with web catalogues that permit live links to be written to points in the database. This product development and implementation will benefit through a streamlining of processes, as well as feedback from the initial libraries that take up the product. Clients will be consulted to determine their priorities for content elaboration within existing modules and development of future modules.

I mentioned earlier our rationale for using javascript rather then plug ins. A future module is planned to train users in the downloading and installation of plug ins, the end result being that an audio option will be available at points within the program. Those of you who have undertaken any Ziff-Davis University (ZDU) courses will appreciate how this can work. In a future release of *Web-ezy*, users will have the choice of reading the information on the screen, or hearing it, thereby catering for different learning styles and preferences.

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Content is already being tested with students undertaking a *Study link* subject at Charles Sturt University. The subject, *SSS007 – Library and information skills*, has 24 students studying by distance education in the first cohort. In addition to the self paced content, we are using a forum or newsgroup, to share experiences and knowledge. With the input of instructional designers, we are seeking to maximise the learning experience of students of widely varying backgrounds. Feedback from this group will assist fine tuning of the content, as will feedback and data gathered from sites where *Web-ezy* is installed. Future versions will allow students to self assess and, if they have the requisite skills, move more quickly through the program. Emphasis will be given to addressing the proposition that 'People usually have a preferred learning style that could be visual, kinesthetic, verbal or auditory'.[1]

UNILINC has a commitment to the future development and ongoing support of *Web-ezy*. New modules will be developed throughout 2000 and beyond to cover other database services as well as other library resource tools. There will also be ongoing development of existing modules to cover, for example, more detailed aspects of the use of the Ovid databases and further work on assessment.

Costs

Web-ezy has been priced to be affordable. From my experience I would estimate that by using *Web-ezy* a library could save up to 80 per cent of the development time to produce and maintain an interactive information literacy program. The price has yet to be finally settled. *Web-ezy* will cost between $6,000 and $10,000 for the base product. This release will include one library system, Ovid and the Internet as defined in the workbook. Additional costs will apply to the optional workshop. These are detailed at http://www.unilinc.edu.au/web-ezy.

Conclusion

With the first version we have concentrated on having the students acquire the skills necessary to search an institution's web based catalogue, Ovid databases and one or two major Internet search engines. Whilst more content could have been included – a point emphasising the need for ongoing development – the program already has approximately 600 html files. This alone indicates the enormousness of the task for institutions that suffer from the 'not invented here' syndrome and undertake their own developments. The *Web-ezy* project is able to amortise the very significant development costs required for a truly interactive program over a number of institutions. This approach is a familiar one to libraries. No major library today develops its own integrated library management system; all choose turnkey options.

Little explicit mention has been made of information literacy. This paper is probably the only paper at this conference to do so. Throughout the development of *Web-ezy*, we have sought to construct modules that will easily integrate with the curriculum. Examples abound in the literature to confirm that this is the most successful way of achieving information literate students. A recent article by Lorie Roth, of California State University reiterates the need for such an approach

> In colleges and universities that are serious about meeting the challenge of the information age, the information literacy of students is a responsibility shared by faculty and librarians and is achieved by integrating information skills into the academic curriculum[2]

Web-ezy offers libraries the opportunity to take increasing control over the training they can deliver online by reducing dependency upon other areas of the university. It removes a great deal of the complexity from the process, allowing library staff to concentrate on improving training through content refinement and elaboration and working with academics to integrate skills acquisition at the point of need within courseware.

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SUBJECT SPECIALIST OR INFORMATION EXPERT?

Liz Hartmann and *Kerry Matheson*
University of Ballarat

Abstract *The University of Ballarat is a small multisector university and has identified information literacy as a desirable graduate characteristic. In order to effectively reach the University campus community the Information Literacy and Research Services team has revised the traditional university liaison model. The University of Ballarat information literacy program has been designed to reflect this model, as staff bring their expertise as information experts rather than subject specialists.*

This paper is presented as a point for discussion. It outlines the way in which our team, the Information Literacy and Research Services (IL&RS) team, has responded to dramatic changes both within the structure of the University of Ballarat and within the information environment.

In considering proposals for a paper to present at this conference the thread that ran through all our ideas was change and adapting to change. The University of Ballarat is a small regional university and because many of our library staff carry multiple responsibilities, some of these changes have been felt keenly. In most instances a single staff member will have had to adapt to a multiplicity of changes. We are fully aware that we are not alone in feeling the impact of government policy regarding universities, and that other universities have also experienced many of the changes that have had the biggest impact on us. What makes us unique is our size, location and consequently the demographics of our student population.

University of Ballarat structure

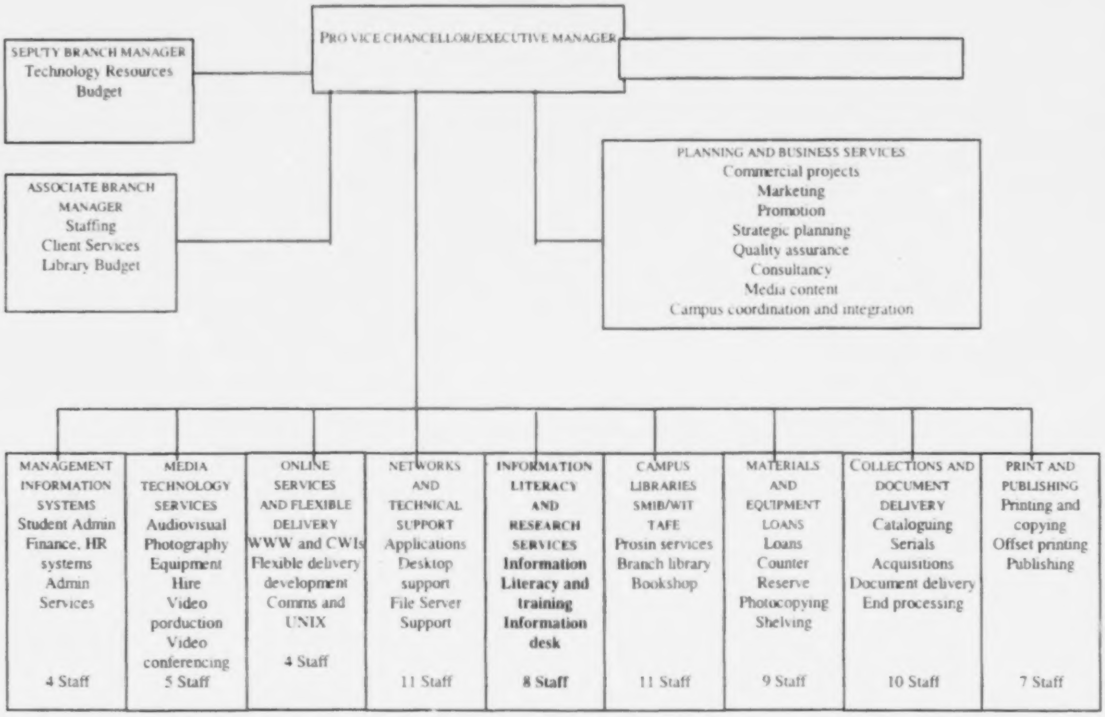
In December 1998 the University of Ballarat was established as a university in its own right, following five years of sponsorship from the University of Melbourne. During 1997 the University of Ballarat Amendment Act established the University as a multisectoral university by formalising its merger with two former Technical and Further Education (TAFE) Institutes, the School of Mines and Industries Ballarat (SMIB) and Wimmera Institute of TAFE.[1]

The University now has approximately 17,000 enrolled students across all of its campuses (8,000 equivalent full time) and a large majority of these are drawn from within the region defined between Horsham and Ballarat. It comprises five campuses, one higher education and four TAFE. There are six branches across the University of which Information Services is one, nine schools within the Higher Education sector, and six schools within the TAFE sector.

The Information Services Branch was one of the first branches to make adjustments to reflect this changed status. Prior to the merger Library Services was combined with Computing Services, Print Services and Media Technology Services to form the umbrella Information Services Branch. Once the merger was in place Acquisitions and Cataloguing were moved to the SMIB campus of TAFE. Computing networks, hardware and software purchases are now managed centrally to ensure that benefits are derived from cost effective purchases of site licenses, as well as ensuring that access to all databases and networks is available from the various campuses. The organisational chart on the following page shows the revised Branch structure.

143

UNIVERSITY OF BALLARAT
INFORMATION SERVICES BRANCH STRUCTURE


PRO VICE CHANCELLOR/EXECUTIVE MANAGER
SEPUTY BRANCH MANAGER
Technology Resources
Budget
ASSOCIATE BRANCH MANAGER
Staffing
Client Services
Library Budget
PLANNING AND BUSINESS SERVICES
Commercial projects
Marketing
Promotion
Strategic planning
Quality assurance
Consultancy
Media content
Campus coordination and integration
MANAGEMENT INFORMATION SYSTEMS
Student Admin
Finance, HR systems
Admin Services
4 Staff
MEDIA TECHNOLOGY SERVICES
Audiovisual
Photography
Equipment Hire
Video porduction
Video conferencing
5 Staff
ONLINE SERVICES AND FLEXIBLE DELIVERY
WWW and CWIs
Flexible delivery development
Comms and UNIX
4 Staff
NETWORKS AND TECHNICAL SUPPORT
Applications
Desktop support
File Server Support
11 Staff
INFORMATION LITERACY AND RESEARCH SERVICES
Information Literacy and training
Information desk
8 Staff
CAMPUS LIBRARIES SMIB/WIT TAFE
Prosin services
Branch library
Bookshop
11 Staff
MATERIALS AND EQUIPMENT LOANS
Loans
Counter
Reserve
Photocopying
Shelving
9 Staff
COLLECTIONS AND DOCUMENT DELIVERY
Cataloguing
Serials
Acquisitions
Document delivery
End processing
10 Staff
PRINT AND PUBLISHING
Printing and copying
Offset printing
Publishing
7 Staff

ISB Statement of strategic intent 1999[2]

So, like a phoenix, the IL&RS team has arisen and reinvented itself a few times. At the forefront of these changes has been the commitment to our core customers the students and staff of the University.

Changing the structure

In order to shape up the reasoning behind our current team structure it is necessary to take a look at our history and past structures. In the past the IL&RS team was known as Reference Services and until this year was structured along the lines of the traditional subject liaison model. Staff provided support at the Reference desk in user instruction and took on subject specialisation for their liaison roles with a small role to play in collection development. Much the same as the model outlined by John Rodwell[3] in his paper presented to the ALIA RAISS conference this year.

However, you do not have to be a mathematician to realise that in a small university such as ours, the number of staff employed in liaison (2.5) is less than the number of schools (9) on campus. So staff necessarily needed to take on more than one subject specialisation. Subsequently staff had to take on a liaison role with more than one school.

Yet another factor impacting on our ability to perform these roles was the fact that some of our staff are part time and not always available for consultation at times that suit faculty staff. The result being, that whoever is available at any given time was often called upon to consult outside their designated liaison. Likewise classes delivered as part of our information literacy program were often taken by whomever was available.

Parallel to these staffing dilemmas, the evolution of information technology was making an impact. As has been identified by many professionals the proliferation of electronic information has not led to disintermediation rather, the opposite has occurred. The traditional structures of information as presented by print forms, with tables of contents organising arguments in a logical format and in turn these items being

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grouped and shelved in logical sequences, has to some extent been replaced by computers. As Rothenburg states, 'search engines with their half baked algorithms are closer to slot machines than to library catalogues. You throw your query to the wind and who knows what will come back to you.'[4] This has not led to complete independence on the part of the would be researcher. Instead it was found students were increasingly asking for support in accessing this new information technology.

This is not to say that information technology has been a burden. On the contrary much of what information technology has to offer is exciting and provides access to information previously outside of our reach. However, our dilemma was how instruction in use of databases was going to be provided, as well as keeping information literacy on the University agenda with our current structure.

A new model

The ramifications of the changing information environment as well as the demand for classes and assistance to staff and students alike were considered. The liaison model in use was clearly not meeting needs. A literature review has revealed that Australian universities are adhering to the traditional liaison model, with Deakin University being among the most recent to adopt it.[5] It became clear that a new model, based on our unique situation, would have be developed. None of our campus libraries specialise in one subject area; they are geographically dispersed and cater for the immediate needs of their individual student populations, either through their print collections or via electronic networks.

In considering ways that information skills programs could be delivered, with current staffing levels, a number of factors were taken into account, not least those already mentioned. One significant element was the pilot information literacy project led by Natalie Radomski during 1997. A report of this project was published earlier this year and clearly outlines its objectives, strategies and outcomes.[6] The point that I wish to draw upon here is that this project involved the School of Education and all members of our team. In one way or another each member contributed to this project either through the development and delivery of classes or through the development of web based support pages and guides. Each staff member was able to contribute an area of expertise not necessarily reflecting a subject specialisation, but displaying a capability to participate in an information literacy program.

The information literacy project enabled the team to view the skills of individual staff and in turn to consider other natural groupings that occur within our University environment, besides the classic subject groupings. The information needs of students and whether these could be grouped within an information literacy program that also reflected the 'cumulative hierarchy of information use' were considered. The above factors identified groupings by year level and these in turn could be linked to the objectives of our programs. The following table displays these relationships.

Year level	**Program objectives**	**Method of delivery**
1st year, newly enrolled students and students at risk	To introduce students to the range of resources available to them. To introduce basic research strategies To initiate evaluation and analysis of information	Self booking information skills program Demonstration of resources Drop in sessions (available from September 1999; still trialing)
2nd year to honours students	To introduce students to subject specific databases and resources To introduce advanced research strategies To build upon evaluation and analysis of information	Curriculum focused classes booked by lecturers Hands on experience in purpose built lab
Post graduate and staff training	To extend knowledge of subject specific databases To extend research strategies including the literature review To deliver information in a flexible mode	Bookings made by individuals or by staff for groups. Through electronic means such as email and web based for block mode students

Another consideration was the skills that staff require to deliver information literacy programs. It was decided that many of the skills taught and demonstrated are generic, hence the title of this paper: 'subject specialist or information expert?' All staff involved in the design and delivery of information literacy programs have completed or are about to complete a Graduate Certificate of Education or a Graduate

Diploma of Education, and have developed expertise in teaching in an academic environment. An element of this qualification has been to conduct action research, the results of which have been used to inform the design and implementation of our programs.

In analysing the content of classes and support materials it was obvious that students contextualise skills if the class is developed within the framework of the subject they are working on. As Radomski identified, information literacy learning experiences need to form part of core curricula and be situated within 'real life information problem solving contexts'.[7] Aside from setting assessment criteria that support this, it has been found, in common with other practitioners, that being able to schedule classes to coincide with an assessment task provides some of the connections that students need. Further, classes are tailored to suit a particular topic. Within this framework it was found that essentially the same skills could be built in to each class, for example, structuring a search strategy including Boolean logic, experience at using subject specific online databases, as well other support materials. In essence the research and information seeking skills of staff were being drawn upon rather than subject specialist knowledge. Examples and exercises are developed through partnerships with academic staff.

Extensive support materials in the form of web based subject guides and help sheets have also been developed. A more recent innovation has been the development, in conjunction with the branch's online services team, of GOLD (Gateway to OnLine Data) providing access from one front page to electronic databases. Unlike Rodwell,[8] it is not considered that taking the information specialist approach is leading to disintermediation, rather, skills that are transferable to a number of different media are being taught. In recognition of the temptation to consider the World Wide Web as an easy access point to information, heavy emphasis is placed on structuring searches as well as evaluating and analysing information. By making the presentation relevant to a particular need at a crucial time the aim is to give students success in their quest for information and, at the same time, provide them with an opportunity to reflect on how the skills learned can be used in other learning situations.

Another benefit derived from the restructure has been the development of a career path for team members. There is now the potential to employ from graduate to management level, as well as an opportunity to increase skill levels. The table below outlines the HEW levels and the duties allocated to each position within the Higher education sector.

HEW level	Position title	Duties
4	Information Officer	Information Desk duties
5	Information Desk Coordinator (a joint position with computing Help Desk)	Coordination of Information Desk environment Maintenance and development of web based subject guides Information Desk duties
6	Information Librarian	Design and delivery of information literacy programs (within designated year level liaison) Reference referral Information Desk duties
7	Manager (IL&RS)	Manage IL&RS team Liaise at Branch level the delivery of all reference and information literacy services

Review

It is now approaching the time of year when our programs are reviewed and this year the new liaison model will be revisited. Some preliminary reflection by the team suggests that perseverance and fine tuning of this structure is required. It sits well within the University environment. This year has been a trying one, as our staff resources have been stretched to the limit. Staff have been on unpaid leave and secondment and in each case their time within the team has only been partially replaced. This has led to a situation where staff have largely been reacting to demand and it has been very difficult to be proactive in initiating and promoting programs. It has also been difficult to extend relations with our TAFE counterparts, again due to staffing limitations.

The future

The year ahead is looking better already. It appears that with a full complement of staff some projects and partnerships across campuses and schools will be developed. The team has been invited to contribute to a mentoring program initiated by Student Services that has already gained support from several schools. This is an exciting venture and will in itself provide fuel for another paper. The postgraduate liaison will continue to converse with the Graduate Centre and assist in providing programs and guidance in implementing information literacy. We also aim to promote our programs more actively to the student population and further develop our drop in sessions and web based support.

Conclusion

It remains to be seen whether or not the new model is suited to dealing with delivery of information literacy programs in our particular environment. At present staff are supportive of the progress made so far. The team does not see itself going the way of the dinosaur. Instead, highlighting our expertise in a broad information environment demonstrates our willingness to adapt to change and our commitment to our key stakeholders. The new model also allows us to slot into structures already operating throughout the University.

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IMPROVING INFORMATION SKILLS PROGRAMS USING ACTION RESEARCH

Claire Hill
The University of Queensland

Abstract *The University of Queensland Library has developed an information skills program for first year engineering students which is integrated into the curriculum and aims to develop information skills among students. The program has been offered to first year engineering students since 1995. Since its inception the program has been transformed radically as a result of applying an action research framework. This framework is primarily concerned with continual improvement and change in practice. It provides a vehicle to constantly (re)assess the strengths and weaknesses of the information skills program. An overview of the development of the program will be presented with particular emphasis on the processes and outcomes of the action research cycle in 1999. A new model for action research will be discussed within this context.*

Approximately 520 first year students enrol in engineering each year at the University of Queensland. The first year of the degree is a generic year with options for specialisation in a specific engineering discipline available at the end of this first year. The library information skills program is included in the subject *9E100 – Introduction to professional engineering*. It is a compulsory subject offered in first semester and focuses on the realistic application of acquired skills to the engineering profession. It is a problem based subject where students are required to work in small groups on a project topic. The student groups can select one of five project topics. For 1999, these were

1 Developing the Roma Street site to make Brisbane better
2 Selection of location and transportation methods for a new minerals processing plant
3 Mission planning for Jupiter rendezvous
4 Waste disposal – a burning issue?
5 Photovoltaic solar cells and the design of a small photovoltaic system

These real world topics are generated and supervised by teaching staff in each of the engineering departments at the University of Queensland. The subject aims to provide students with

- experience in working effectively in teams
- experience in managing a project effectively in teams
- practice with the tools of professional engineering, including written, oral and graphical communication, word processing, spreadsheets, and the use of technical information sources
- exposure to the past, present and future role of engineering in society, especially in Australia
- an introduction to safety, sustainable development and life cycle analysis
- an introduction to the concept of a profession and associate aspects such as ethics.

The Library has provided an integrated information skills program within the subject since 1995. Over the past four years this program has evolved from paper based to web based. The anticipated learning outcomes of the information skills program are that students can

- use the Library confidently and competently
- develop an understanding of the importance of information in engineering practice
- recognise the variety of information sources
- evaluate the information found
- cite the information used.

The information skills program comprises several components. A library based web page is the central focus. The web page was developed using WebCT authoring software. The software allows virtual learning spaces for students including a bulletin board and chat facility. These learning spaces are very popular for students developing their project topics and discussing issues with each other, lecturers, tutors and librarians. The main content of the web page is a section for getting started, which is tailored to each topic, and also hints on refining searches using boolean operators, truncation and considered search strategies. A small section of the web page is devoted to subject materials such as lecture notes, and curriculum information.

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The web page is supported by hands on classes (30 one hour classes), a lecture on various aspects of creating a bibliography for a research project, voluntary classes on the Internet and databases, library tours, and assessment items. The content of the information skills program and the creation of the web page using WebCT software has been well documented by Woodall, Hill and Woodall, and Cribb.[1-3]

Action research

Librarians at the University of Queensland Library use action research to improve the information skills program for first year engineering students. The term action research captures the notion of disciplined inquiry (research) in the context of focused efforts to improve the quality of the organisation and its performance (action). The potential is the development of a professional ethos in which members of the organisation continually strive to improve their performance as educators and to provide positive learning outcomes for students. Zuber-Skerritt states the aims of action research are

> to improve the practice of learning, teaching/training or management in a systematic way and, if warranted, to suggest and make changes to the environment, context or conditions in which the practice takes place, and which impedes desirable improvement and effective future development.[4]

A primary characteristic of action research is that it is carried out by practitioners so they can improve their understanding of problems and increase the effectiveness of their practice. It does not involve researching the work/programs of external players. The focus is on the practitioner working towards the improvement of their local programs and practices. The action research process is a collaborative, group activity. In this sense the situation and solutions of one institution using the framework will be very different from another institution.

Reasons for application of action research framework

There are many reasons for applying the action research framework to the information skills program offered to first year engineering students at the University of Queensland. Most importantly, it is an effective approach to educational development, professional staff development and student learning. It provides a vehicle to constantly reassess the strengths and weaknesses of the information skills program based on the original purpose and objectives. The process of applying the framework brings clarity to the objectives of the information skills program, providing a structured approach to evaluation, reflection and planning. This is particularly important in this context as responsibility for the coordination of the program changes each year. The framework acts as a guide to the program's history and to evaluation and reflection.

Action research demands change. The Library's objective is to improve information skills by positively impacting on learning processes, learning outcomes, and the learning environment. The framework provides opportunities for new directions in teaching and learning and in incorporating technological developments. Action research is complementary with lifelong learning as both, in essence, deal with continuity.

Action research models

The action research framework involves a cyclical or spiral course of planning, acting, observing and reflecting. The cyclical process is fuelled by the need for continual improvement and change of practice and the search for increased knowledge and understanding. This framework acts as a mechanism for inquiry, discovery, critical analysis and action. The relationship of these processes can be seen in the basic action research spiral in figure 1.

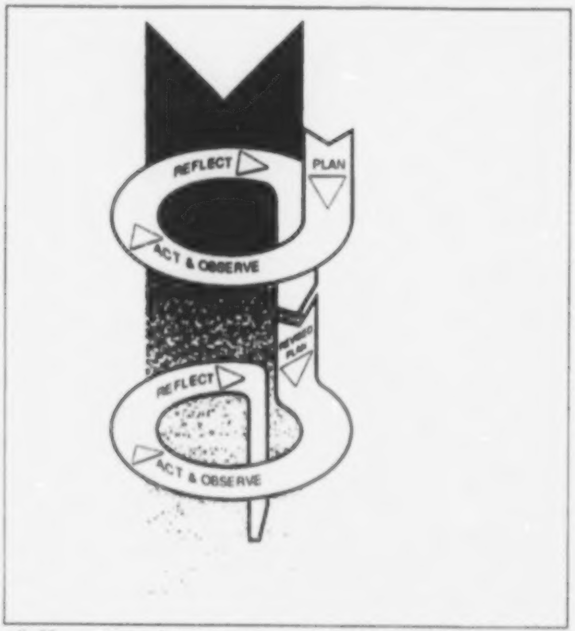

Figure 1 Kemmis et al Action research spiral model[5]

Planning involves defining a specific problem or situation that needs to be addressed, investigating alternatives, and developing a schedule. *Acting* involves implementing the plan. *Observing* or evaluating involves carefully considering the kinds of evaluation appropriate and then applying these methods to the action. It provides a basis for formal reflection. The formal *reflection* process involves looking critically at the results to determine the success of the original plan and the weaknesses to be improved upon.

Zuber-Skerritt[6] has taken this traditional spiral model and altered the direction of the arrows upwards to indicate the 'continuous improvement of practice and extension of knowledge' that encapsulates action research. Indeed, the achievements and knowledge gained through each cycle are notable. The progress made builds a foundation for subsequent cycles. A positive experience is depicted through the relationship between the cycles. This model is presented in figure 2.

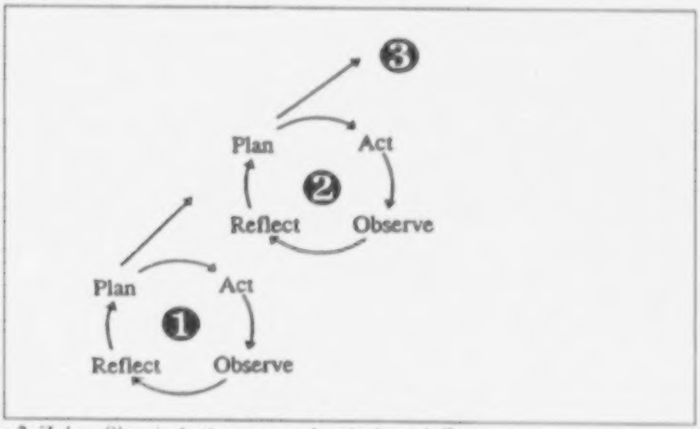

Figure 2 Zuber-Skerrit Action research spiral model[7]

As a result of the action research process in the context of the information skills for first year engineering students at the University, a new model for action research has been developed. This model builds on figure 2. It presents the snowballing effect of the cyclic process as occurring on two levels. The new model, provided in figure 3, visually portrays the patterns and relationships of action research in this context. In effect, the two levels operate simultaneously with the snowballing occurring slowly on the macro level and rapidly on the micro level.

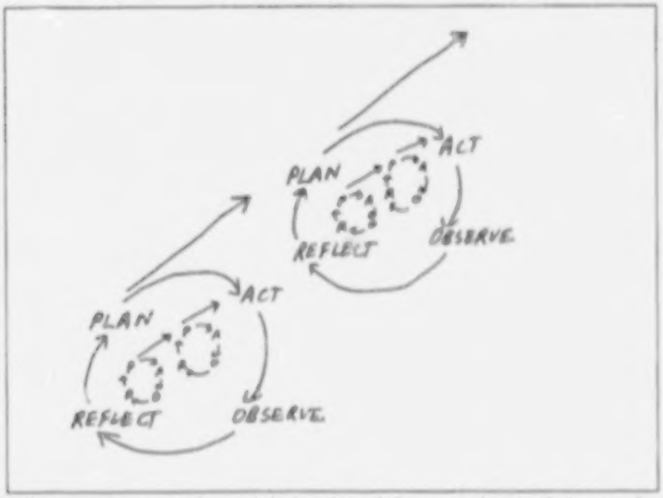

Figure 3 Action research model developed from analysis of the application of the action research framework to the information skills program for first year engineering students at the University of Queensland

The macro level represents the larger action research process of the information skills program where the entire program is evaluated and reflected at the end of semester. Changes are then considered and implemented the following year. The cycle of planning, acting, observing and reflecting is applied to large issues to do with the development of the program as a whole. These macro cycles take the form of recommendations for program improvement. They are complex issues that take time to resolve. For example, in 1999 three recommendations (macro level) were devised. These were

- integrating the information skills (in particular the web page) further into the subject
- redesigning the web page to make it less confusing to students
- revising the one hour lecture to make it more stimulating for students.

The issues that are addressed at the micro level are those which, because of their smaller size, can be addressed immediately. They surface within the larger cycle and the process of planning, acting, evaluating, and reflecting is much quicker. The nature of these issues is such that they can be resolved as soon as they surface. For instance, it was observed that the students were not using the bulletin board and that they were having difficulty using threaded discussions. To remedy this, a step by step guide on how to compose and reply to messages was created and handed out to all students during a weekly lecture. After this time, the traffic on the bulletin board was much heavier. Students were even using the bulletin board facility well into second semester, after the subject had finished.

Another observation on the micro level, was that the survey used in the past for evaluating the classes and web page did not collect appropriate data. It was also handed out to students too late into the semester. Consequently, a more comprehensive survey was written and given to students for completion at a more appropriate time. This proved to illicit relatively more intelligent feedback.

It must be noted that McNiff presents a similar model of action research cycles operating simultaneously on a smaller and larger scale. The difference between the Kemmis and Zuber-Skerritt models (figures 1 and 2) and the new model along with McNiff's (figures 3 and 4) is that the Kemmis and Zuber-Skerritt models can only deal with one problem or issue at a time. McNiff argues that 'action research should offer the capacity to deal with a number of problems at the same time by allowing the spirals to develop spin off spirals, just as in reality on problem will be symptomatic of many other underlying problems'.[3]

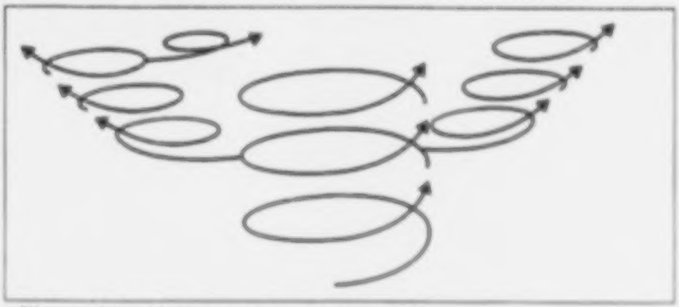

Figure 4 McNiff's action research model[9]

There is a difference in the depiction of the macro and micro levels between the new model and McNiff's model. As can be seen in figure 4, the micro level spirals in McNiff's model push outwards whereas they are contained within the macro in the new model. The outward spirals tend to make the overall representation seem disjointed, particularly for application to the information skills program discussed in this paper. McNiff's model presents the problems and solutions as having different directions and does not seem to reflect a common outcome for all of these new problems. The new model attempts to capture the process of addressing and working towards common objectives.

The idea of several cycles occurring simultaneously is significant. In all action research models, a relationship is displayed between each component (planning, acting, observing and reflecting). Yet the models present these components as occurring singularly and in a regimented way. It can be argued that the actual approach is not as fragmented. In the instance of the information skills program for first year engineering students, reflection tended to occur throughout the entire process. Although its intensity and formality differs at varying stages of the process. Therefore, in this context, the reflection is both formal (within the cyclic structure) and more informal (between components in the cyclic structure). Both of these kinds of reflection are related to the fulfilment of learning objectives and the commitment of staff to learning outcomes. The difference lies in the formal reflection being a means of critically evaluating the success of the original plan within the formal construct of meetings as a group. The results of evaluations such as focus group sessions are discussed at some length within these group meetings. The informal reflection occur on an individual basis at random times throughout the cycle. The model in figure 5 attempts to represent this idea.

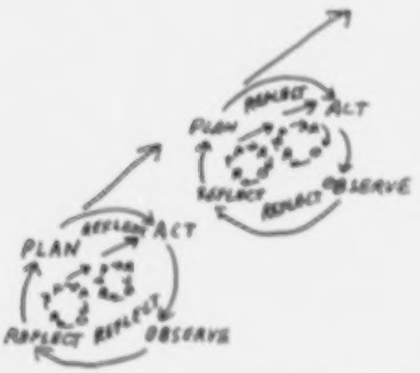

Figure 5 Action research model showing formal and informal reflection

Applying the cycles: evaluation and reflection

Evaluation takes the form of a survey, focus group session, assessment and observation. Formal evaluation tends to 'kick off' the cycle each year. At the end of the program in 1998, a first year student, James Brennan, was employed to expand on the basic responses received through the survey and to provide input for the development of the web page for 1999. James had completed the subject in 1998. His involvement focused primarily on the structure and content of the web page so that library staff could gain a better understanding of the student experience. An inventory of the information sources James and his group had consulted to complete the subject project and also in the first year of study at university was also compiled. This exercise is a feature of the taxonomic approach presented by Nahl-Jakobovits and others which involves taking an inventory of library skills so that information skills instruction addresses the behavioural domains and affectively results in students. These skills are

- being motivated to learn research skills
- getting involved in the learning approach
- experiencing the pleasure of discovery
- feeling comfortable in a complex information environment
- being confident in the ability to evaluate material
- having a sense of accomplishment from productive searching.[10]

This exercise attempted to identify student instructional needs, that is finding out what they know already and what they need to know. It provided valuable information regarding the first year engineering student learning experience at university.

In 1999, the inquiry process was more comprehensive. A focus group session was held with seven participants. Each of these participants had completed the information skills program and the first year subject. The range of knowledge, motivations for learning and learning styles varied between these students. The results of the focus group session exposed strengths and weaknesses in the content and delivery of the information skills program.

The students expressed the need for more classes tailored to students with different skill levels, particularly in using the Internet. While this issue has been considered, it may be logistically difficult to arrange because the students are divided into groups of 100 for each project topic and attend tutorials on different afternoons depending on their topics. To survey students regarding their skill level and then divide the student body into novice, intermediate and advanced groups means that they could not attend with other project group members. It might also be difficult to obtain an honest indication from each student regarding their *actual* level of skill as opposed to their *perceived* skill level.

The focus group session also revealed the need for students to discuss and develop their project topic as a group in a defined virtual space. It was suggested that a web page that is accessible to group members only could be available to students to develop their ideas. The WebCT software has a facility that can support this form of group work. Librarians have discussed the idea of requiring each group to include a section on their research processes within their web page.

A comprehensive survey was completed by 72 per cent of the students. It revealed the need for more information skills classes and that these classes should aim at different stages of the learning process. The 1999 classes worked well as a basic introduction to the information skills web page and the Library. However, once the students started investigating their project topics their information needs changed and they needed more specific classes.

A structured approach to the web page classes that relates to student information needs and the learning process must be established. Students seek guidance at different stages of the learning process. The competencies learned at this basic level should be developed with subsequent classes held at critical stages in the information seeking process. Information skills classes need to be tailored to meet changing information needs. The web page should be restructured so that there are defined components which begin with basic library skills and incrementally develop into intermediate and advanced information skills.

The electronic quiz is another issue that needs redesigning. The survey revealed that approximately 50 per cent of those students who responded thought the level of difficulty of the quiz was either somewhat elementary or very elementary. Furthermore, of those who completed the quiz (506 students), 85 per cent received full marks. This gives an indication that either the students are good learners and have developed certain competencies in information skills, or that the questions were too basic. It is suspected that the latter is the case. As librarians noticed that for some students, the first time they had entered the web page since the hands-on class was to submit the quiz in week 10 of the semester. The quiz needs to contain randomised questions and be broken into several smaller quizzes. The content of each quiz should reflect a development in student competency in line with the changes to the web page suggested above.
Assessing student learning through a compulsory online quiz, bibliography and exam question, provided another means of evaluation. This method of analysis gave an understanding of cognitive learning in that the

students could demonstrate information literacy concepts through knowledge recall and intellectual skills. The quiz, worth eight per cent of the total mark for the subject, consisted of sixteen questions based on the content of the web page. Students were required to electronically submit the quiz towards the end of the semester. The bibliographies included in the final project report were assessed by library staff for variety of information sources cited, the relevancy of information sources cited, and the use of correct citation style. This was worth five per cent of the total marks for the subject. This assessment gave librarians an idea of the concepts the students had, and had not, understood and also how they had applied concepts to complete the project reports.

Applying the cycles: planning and action

Following this evaluation process and formal reflection, several major recommendations have been drafted which will be discussed and acted upon in the following months in preparation for Semester One, 2000.

Recommendation 1

A web page is needed for the entire subject including progressive marks for each assessment component of the subject, a clearly identifiable assessment schedule, lecture notes for all project topics, and virtual spaces for group learning. This could take the form of a facility for group chat (so that members can discuss the project privately) and also a facility for groups to develop their projects online (a group web page that is password protected). The group web pages could be the medium in which they deliver their final project and a section of this could be allocated to the groups identifying their search strategies.

Recommendation 2

Redesign the information skills program (web page and classes) so that there are defined components which compliment learning and information needs. Attach a quiz to each of the components and randomise quiz questions. For example

- Component 1
  Basic library skills (tour, the layout, catalogue, borrowing)
- Component 2
  Getting started with your topic and finding the information you need (useful starting points, how to find a variety of information sources, search hints, boolean and truncation techniques)
- Component 3
  Writing up (format of a report, citing references, creating a bibliography)

Recommendation 3

Consider the schedule of information skills classes. Students wanted more library classes held at times when they were encountering problems. Throughout the semester their information needs for the project intensified as the project topics were discussed and developed. A solution could be for librarians and tutors to work more closely. For example, librarians could attend tutorials for 30 minutes in the latter part of the semester when students have a better understanding of what information they need to complete their projects. This would provide students with the opportunity to learn how to find journal articles using databases at a time when they have this need. Another solution may be to capitalise on the 30 hours of teaching time usually spent with sixteen students at one time in a hands on class and use this time to see all students more regularly in large groups.

Conclusion

It is evident that the action research framework provides an excellent structure for program renewal. Although the cycle tends to focus on weaker aspects of the program that need improvement, the process is by no means negative. The development of the teaching, instructional and technological skills of the librarian's involved is momentous. The information skills program has evolved into a more focussed student learning program. The underlying goals of creating a positive learning environment and nurturing student learning outcomes have been achieved in different ways each year. These objectives will continue to push the cycles forward and the information skills will continue to evolve into the new millenium.

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AN AUSTRALIAN INFORMATION LITERACY INSTITUTE PROPOSAL

Diana Kingston
University of Sydney

This draft proposal (23/7/99) had been presented to the Council of Australian University Librarians (CAUL) at a meeting held in October 1999. It was also discussed during the conference.

AUSTRALIAN INFORMATION LITERACY SITE (PROPOSAL)

General proposal

This is a proposal for the Fourth National Information Literacy Conference to give consideration to sponsoring the establishment of

1 ***An Institute or Task Force***
An institute or task force is needed to promote and foster the development of information literacy (IL) throughout the Australian community. A possible name for this institute would be the Institute for Information Literacy (Australia) or IILA.

2 ***A multi purpose Internet site***
A multi purpose Internet site is needed to support information literacy activities, programs and services to develop information literacy in the Australian community.

Librarians, educators and governments in Australia and internationally are increasingly recognising the importance and benefit of information literacy to members of the professions and to individuals, nations and society in general. The present proposal draws heavily on a model already established in the USA under the sponsorship of the Association of College and Research Libraries (ACRL) and the American Library Association (ALA).[1] In addition, this proposal directly caters for a potential end user population in a way that might overcome voids in the provision of information services in Australia.

An Australian information literacy Internet site is envisaged as having two faces: one for IILA members and one for the community at large. The *Online Australia* website would probably be interested in providing a link to the public segment of an IILA website (as indeed it has to the Australian Libraries Gateway website).[2]

In other words, an IILA site could potentially serve several functions, including

- communication within the information literacy community on issues, initiatives etc eg via an email discussion list
- facilitation of systematic information literacy course design and planning, incorporating current standards such as the ACRL standards[3]
- hosting of draft information literacy information resources for peer review
- hosting of information literacy train the trainer courses and materials
- hosting of information literacy course materials for remote access by end users (students and others, whether by referral or independent discovery)
- reference services as appropriate (FAQ, referral, reply)
- provision of links to other information literacy useful sites
- provision of bibliographies, reference lists and guides to information literacy information resources

Guiding principles

Principles underlying the present proposal include

Inclusion
The principle of inclusion refers potential stakeholders at both (a) input into IILA and an IILA Internet site and also (b) use of information resources and programs provided by IILA/the Internet site. On the input side, it is important that individuals and organisations who are committed to information literacy should be included in IILA, regardless of sectoral and subsectoral affiliations. This would be an opportunity to bring together librarians and educators with a common interest in information literacy. It is important that quality information literacy programs and resources should be made widely available to the Australian community, including to individuals in the community at large ie University, TAFE, K-12 and the general community.

Quality assurance
Quality assurance policies and processes should underpin IILA's activities, programs and information resources. This is important for the credibility and viability of the project. Course materials and programs should be based on sound educational principles and be educationally defensible.

Stakeholders and outreach
As mentioned above, it is important that the approach should be inclusive. That is, appropriate participation from individuals and organisations in all sectors of librarianship and education should be solicited and welcomed. Government support should be sought as appropriate because of the importance of information literacy to the nation.

In terms of end users, possibly in part a similar approach to that of the providers of free to air programs (radio/television) by Open Learning Australia could be adopted. Web resources would be complemented by email and other forms of communications as appropriate.

It is to be expected that a service oriented approach from an IILA website would generate reference inquiries. These may in part be serviced through a FAQ service and referral on to appropriate libraries. It would be advisable to be prepared to offer a limited email reference service which might be augmented in the light of experience.

Training and staff development
A comprehensive training and development program for interested librarians and educators should be drawn up to support this initiative. The training effort would be quite substantial initially. For librarians teaching skills training needs should be addressed.

Monitoring of information literacy developments and resources
IILA would monitor and provide Internet links to quality information resources and sites within Australia and internationally.

Coordinating information literacy initiatives
IILA would coordinate and act as a clearing house for various Australian information literacy initiatives and materials as appropriate.

Possible first steps

- set up an information literacy advisory group (ILAG) to plan establishing IILA and an Australian IL Internet site.
- sponsor an invitational day on the model used by ACRL (for a similar event held at New Orleans on 9th January, 1998) with a view to establishing an Institute for Information Literacy (Australia).
- approach stakeholders for participation and support (financial, human, organisational, physical infrastructure).
- find a major sponsor (ALIA?/CAUL?) to assist IILA to establish an Internet site.
- find a major sponsor to assist IILA to establish and maintain training programs for interested librarians and educators.

The role of ALIA

A partnership with ALIA for the project would be desirable if the ALIA Renewal process were to establish a platform for such cooperation between IILA and ALIA. One would hope that in time, the public segment of the site would be heavily used.

Benefits to participating libraries

An Australian information literacy site such as that proposed would be expected to benefit member libraries and educational institutions in various ways. These include enhancement in

- staff development in information literacy
- sharing of information literacy ideas and resources between institutions
- improved design and delivery of information literacy resources
- cost containment/savings through cooperation and collaboration (eg in shared development and delivery of information literacy programs)
- services to clients
- marketing of profile of members (individuals and institutions)
- partnerships between educators and librarians
- development of self directed client information literacy skills

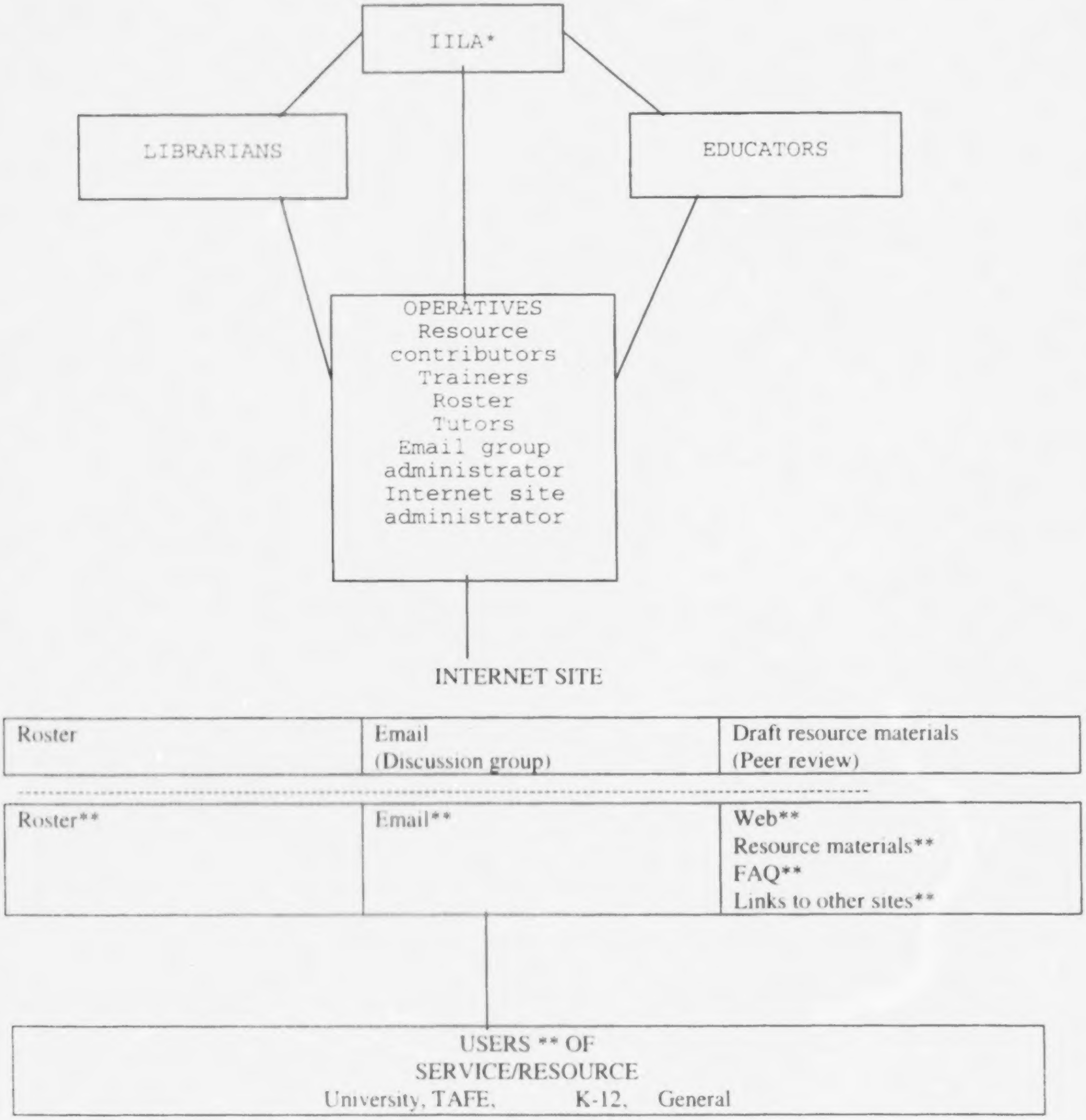
Benefits to librarians and librarianship

This is one area of endeavour where librarians could reach a fuller potential in exploiting their expertise to the benefit of the community at large. They could embrace the possibilities of the Internet to assist individuals to access, select, evaluate and manage information resources. This would permit librarians to market the profession more directly and effectively to the community through practical outreach. All this is important when librarians feel undervalued, by passed and threatened because of economic pressures and direct end user access to information on the Internet. As librarians themselves are aware (unlike others perhaps), their information management skills in the next century will be as relevant as ever they were. These skills could be very easily overlooked, unless such proactive initiatives as those outlined in this draft proposal are undertaken by the current leaders in Australian librarianship.

Such an initiative would support, complement and enhance programs which foster self directed, self paced learning in a flexible environment. It would assist Australia to participate in the global flexible and distance education market place.

In conclusion, we look forward to the time when we can begin to use a multipurpose information literacy Internet site for the cooperative promotion of Information literacy in Australia. Figure 1 provides a diagram summarising major aspects of the proposal and Figure 2 suggests tasks for inclusion in an IILA project schedule.

Figure 1Australian Information Literacy Site: an overview


IILA*
LIBRARIANS
EDUCATORS
OPERATIVES
Resource contributors
Trainers
Roster
Tutors
Email group administrator
Internet site administrator
INTERNET SITE
Roster
Email
(Discussion group)
Draft resource materials
(Peer review)
Roster**
Email**
Web**
Resource materials**
FAQ**
Links to other sites**
USERS ** OF
SERVICE/RESOURCE
University, TAFE, K-12, General

* Institute for Information Literacy (Australia)

** Public face of the Internet site

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*Figure 2Suggested Project Schedule Tasks **

1. Establish ILAG; commence planning	10. Recruit trainers
1. Invitational meeting - information literacy stakeholder representatives	11. Train trainers
1. Establish IILA; continue planning and evaluation	12. Recruit tutors
1. Identify Internet site host (including hardware)	13. Plan public face of Internet site for the Australian community
2. Recruit education consultants	14. Publicity materials
3. Recruit Internet site manager	15. Recruit Internet site roster (?volunteers)
7. Establish information literacy email discussion group	16. Implement public face of information literacy Internet site the for Australian community
8. Train the trainer program design Objectives Evaluation criteria Course Materials	14. Libraries implement information literacy strategies (ongoing from earlier stage)
7. Tutors program design Objectives Evaluation criteria Course Materials	15. Information literacy project evaluation and review (ongoing)

*not necessarily complete nor in priority order

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COOPERATION AND INFORMATION SKILLS RESOURCES

Diana Kingston
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Abstract *In the information literacy skills area we have at least three tasks to keep in balance. First, we must watch the literature for relevant research on the teaching and learning of generic skills. Secondly, we need to unpack and communicate a coherent information literacy agenda. Thirdly, we must integrate support for information literacy learners strongly within relevant topical or subject contexts. When one begins to consider potential components of a coherent, systematic and comprehensive information literacy skills teaching and learning program, including one within a particular information context, subject area or discipline and involving web based courseware and possibly problem based learning activities, the task ahead appears daunting and expensive. Nevertheless, projects involving the design, development and implementation of systematic and coherent educational programs, which aim effectively to support learners of information literacy skills, would be worthwhile and important undertakings. Of all professional groups, librarians, as perhaps the only professional group in this position, are well placed to take up the challenge of developing such comprehensive information literacy programs. It would be an important opportunity lost if we could not find a way to so do.*

The phrase information literacy continues to be embraced within the library and information management field as a useful portmanteau descriptor for a cluster of knowledge, skills, competencies and attitudes which an individual now needs effectively to identify, access, manage and use information in their fields of interest. There are signs that information users of various types, other than librarians, also find the phrase useful as a descriptor for a kit of knowledge and skills which they are becoming aware that they need in order to operate successfully in various settings. An example of this within the literature of the field of Dentistry is a recent prediction that '...information literacy will become a competency for all students and practitioners. Most certainly dental school accreditation standards will change to include requirements for information literacy and other technological competencies.'[1] The interest shown even in brief references to possible information literacy initiatives during conversations between library and other staff at my own university bear out the observation that this is generally found to be a convenient, if not fully understood, descriptor for a general area of much needed expertise.

Thus, the term information literacy appears to have the potential to provide a mutually accessible meeting ground between librarians and their client communities. That the scope of the phrase is not fully understood should be taken as a challenge for librarians to set out systematic, comprehensive, transparent and coherent agendas in this field. Efforts in this direction are very much needed and those such as the draft ACRL *Information literacy competency standards for higher education* have already proved to be an invaluable point of reference.[2]

Further, the descriptor information literate turns our focus onto the individual information user and away from the information mediator (the librarian). This refocusing potentially facilitates educational planning and goal setting in relation to learning information literacy programs. Educational outcomes may be expressed as knowledge, skills, competencies, attitudes and activities which an information literate person would demonstrate or perform.

Generic skills and information contexts

It is important for this paper to mention the ongoing debate on and research into the generic skills concept. Information literacy is commonly referred to as a generic skill (as is the group of skills called communication skills). For the purposes of discussion and research, these concepts must be further 'unpacked' and analysed. For example, report writing, oral presentation and graphical communication are part of the communication skills cluster. Clanchy and Ballard consider that generic skills can be grouped into three main fields of educational activities

- thinking (and reasoning)

- research (including methods of enquiry and management of information)
- communication (oral and written).[3]

Information is de facto about a specific topic or subject and thus information invariably has a subject context. The influential Higher Education Council report *Achieving quality* asserted that generic skills 'will be introduced and refined in a subject related context – indeed, it is only through the study of a body of knowledge that they can be acquired'.[4] Clanchy and Ballard also say

> Our own experience over nearly two decades of working with both undergraduate and postgraduate students seeking to acquire the appropriate generic skills suggests the following ... while such skills cannot be learned *in vacuo*, indeed they must be learned in the context of a specific discipline or body of knowledge, they do not – once learned – have to be learned totally anew in each new context of learning. Some degree of transfer does occur ... Precisely what is involved in such transfer of skills ... is presently unclear ...[5]

As they cross from subject to subject at the workplace, librarians in fact provide case studies of how various information literacy skills are to a certain extent transferable. This happens, for example, at the reference desk, when librarians assist users of different electronic database systems. On the other hand, the experience of librarians is also that the information and literature of one particular subject discipline presents particular access and management challenges different from those of another discipline. To guide our users, one task for us, as librarians, is effectively to identify, distill and articulate the commonalities in information skills needed across subject disciplines and information systems. Does this experience bear on the following courseware questions: what should a reuseable courseware shell consist of and, of what should the interchangeable content consist?

Research continues into the identification of effective practices for the learning and teaching of generic skills. For example, Barrie and Jones conclude that few existing generic skills curricula

> encompass all relevant elements and few are adaptable to suit different stakeholder perspectives. In attempting to comprehensively map the various elements of a generic attributes curriculum the following key curriculum facets were identified by the authors
> - teaching and learning philosophy and values
> - teaching and learning policy (all levels)
> - intended learning outcomes and targets
> - teaching and learning process (strategies, practices and resources)
> - assessment process and targets
> - content (including organisation).[6]

From the results of a study in the United Kingdom, Kemp and Seagraves concluded that these generic skills can be delivered and that their results substantiated this view provided the regime adopted for the development is carefully nurtured. However, 'it is difficult to produce satisfactory results by "tinkering" with existing courses to incorporate skills'.[7]

Forces for collaboration and the sharing of expertise

There is currently a convergence of forces which suggest that it is timely, indeed imperative, for librarians to consider various forms of cooperation both in the use and also in the production of resources to promote and teach information literacy within our respective communities: local, regional and national. These forces are economic, social, educational and technological in nature. Some possible benefits of cooperation between librarians using a proposed Australian Information Literacy Internet site to further the information literacy agenda are listed towards the end of this paper.

Examples of the need for cooperation and standardisation in educational initiatives (in fields other than librarianship) were the focus of a recent Teaching and Learning Forum in Sydney. This was one of a series of similar forums held in four Australian capital cities, sponsored by the Australian Committee for University Teaching and Staff Development (CUTSD) and featuring presentations by Diana Laurillard, Professor of Educational Technology at the UK Open University.[8]

Partnerships as a precondition for funding

At the Sydney forum, it was suggested that priority would henceforth be given to proposals for courses and courseware development project grants which showed evidence of simultaneous or partnership proposals for the same projects from within several Sydney Basin Universities. In other words, funders were indicating that the costs involved in course and courseware development need to be spread over several institutions.

Learning activities embedded in courseware shells

Professor Laurillard demonstrated a single web based courseware shell which was designed to engage students in a particular learning activity that could be used by several disciplines. In other words, the web based shell could be reused with different content, for example content related to topics as diverse as chemicals or art objects. A courseware shell aims to meet the same type of learning objectives regardless of discipline, such as to enable students to debate their ideas about chemicals, art objects and so on.

The Instructional Management Systems Project (IMS)

IMS is a global coalition of academic, commercial and government organisations working to define the Internet architecture for learning. IMS is developing technical specifications that will support learning from K-12, through to higher education and training. Standards are being promoted as a way of improving quality and reducing redundancy in courseware development.

The National Teaching and Learning Database Project (NTLD)

The NTLD is an Australian cooperative system providing online access to a comprehensive range of online teaching and learning objects for Australian post secondary education. It has links to AUMOL, the Australian University Museums Online system. It is hoped that objects as images will be actively both used from and contributed to this database.

Educational programs and the Internet

The delivery of resources supporting entire educational (including degree) programs on the Internet will increase. A segment at the Forum was devoted to the example of the University of Sydney Medical Program, which is being showcased, or promoted externally, in November 1999. Visitors may view the Medical Program Web site at any time throughout the year at their convenience.[9] Characteristics of the program include the following educational approaches: self directed learning, group work, problem based learning, integration of subjects within and across years, use of new information technologies and flexible delivery, assessment with an emphasis on feedback and self evaluation, opportunities for research and evaluation and quality improvement. There is an underlying recognition of the importance of dialogue and conversation in educational processes. Therefore the technology is secondary, despite its important facilitating role within the program. Planning is underway for a University of Sydney Dental Program with similar educational characteristics.

Supporting information seekers

The need for and the benefits of cooperation and collaboration in supporting individuals to acquire information literacy skills is apparent in all sectors and indeed outside of traditional sectoral boundaries. Librarians are disturbed at having to under service or turn away inquirers with poor information literacy skills due to lack of institutional resources. Sometimes this happens because the organisational mission, reinforced by budget constraints, in practice precludes provision of information literacy advice and assistance to individuals coming from other sectors, institutions and the community at large. There is still a great divide between the information rich and information poor. In some cases, there is no obvious, effective and timely source of expertise in information literacy to which one may refer end users. From several perspectives, including social and economic perspectives, it would be very worthwhile if we could devise a national infrastructure which would support lifelong learners to develop their information literacy skills, that is, whether or not they happened to have institutional affiliations.

It is important to acknowledge the existence of individual differences in information literacy skills, aptitudes and needs. These differences are readily observable even within the personnel of, for example, a single library organisation. In any information literacy courseware infrastructure, this would necessitate the provision of graded information literacy programs and learning tasks within a framework of client centred and adult learning principles. Much discussion on information literacy tends to be framed in terms of absolutes and does not address the issue of individual differences in capacity and need. Clanchy and Ballard note the 'acts of identification, selection and evaluation [of knowledge and information] are all in turn framed by the purpose which the researcher brings to the research task'.[10]

In the health information field, for example, satisfactory results from an electronic database search on a particular disease would be very different depending on whether the end user was a patient who was seeking some basic information on an illness or a scientist whose need was for a comprehensive literature search to inform and guide research into a new direction in that subject area. Both would be legitimate reasons for interrogating an identical electronic database within the health subject field using different search strategies to satisfy respectively different purposes. Individual differences in the aptitudes and skills of information users and the different purposes for which individuals need information skills are strong indications that librarians need to be very much aware of client centred and adult learning principles in their role of supporting learners to develop their information literacy skills.

Teaching skills for information skills librarians

Teaching of information skills will potentially be a major role for librarians in the 21st century. It is important that opportunities for teacher training of various kinds be routinely available to and undertaken by information skills librarians. Teaching skills training should be included in the list of criteria for appointment to information skills positions. Staff development programs should provide opportunities for personnel to undertake teacher training courses appropriate to their needs. Indeed course options on teaching skills should be available to all students enrolled in formal educational programs in library and information management.

I would now like to present some experiences and also insights for future cooperation and collaboration received by a group of information skills librarians from around Australia, including myself, who participated last year in a pilot or trial of a web and email based course entitled *Flexible teaching skills for information skills librarians*. The course was provided and presented by a course team at the University of New South Wales. The course team had seven members (two from the library and five experienced educators including one involved in the development of the *Webteach* software which supports the course material and student/teacher interactions).[11] [12]

The course used a dual approach to train the trainer ie the information skills/reader education librarian. This was achieved through our actual participation and also by seeing the course and programs involved as examples or demonstrations of how such a course might be designed. The underlying philosophy was that course materials published on the web should be educationally defensible. Information skills resources for library users were created and reviewed by the course participants. Choice of projects was left to the participants, content being derived from a course plan prepared in an earlier module.

The course consisted of six modules (summarised below) plus an evaluation module, in which we focused on our work and also evaluated the *Teaching skills* course itself. This evaluation was designed to assist in the modification and improvement of the course prior to its being released as a fee attracting certificate program in coming years. At that stage, three of the modules were web and email based and three were face to face sessions. The course was firmly grounded in educational theory and best practice and was strongly influenced by adult learning principles of effective self paced, self directed learning. The underlying philosophy was that course materials published on the web should be educationally defensible.

This general approach to reader education would appear to be a significant educational model of the future: web based self instruction modules, wherever possible complemented by face to face sessions (and possibly synchronous Internet sessions).

Summary of the teaching skills course content

Module 1	Adult learning and development
Module 2*	Human memory – learning, remembering and forgetting
Module 3*	Communication and experiential learning
Module 4*	Evaluation [general principles/how to evaluate]
Module 5	Instructional design
Module 6	Using technology in teaching
Module 7	Review and evaluation [of our work and of the course]

* face to face sessions at UNSW

Importantly, the evaluation module provided insight into how to build learning outcomes and evaluation activities into course planning.

Commonalities: themes, sub themes, issues and problems

When we information skills librarians viewed each others' work (that is our assignments to produce course resource materials after they were mounted together on the web), we became aware of common themes running through what we had produced. We realised that despite the variety of approaches and subject content there was enormous scope for cooperation and collaboration between librarians working on the production of web based information literacy materials. Some examples of common themes, subthemes and issues which became apparent in the resources review process included

- analysing research questions/topics
- selecting databases
- boolean searching
- truncation and wild cards
- vocabulary (thesaurus) versus textwork searching
- search engines
- databases concept
- transfer between particular information resources (electronic databases, library systems)

The resource review process elicited suggestions for the creation of a cooperative Australian web site and email server where we as information skills librarians could continue to collaborate, discuss our work (including web based teaching resources) and share expertise. We wanted to continue to interact, however because our course had finished we would no longer have access to a shared Internet site, where we could mount our work and carry on discussions as a group.

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STRIKING THE RIGHT BALANCE: INFORMATION LITERACY AND PARTNERSHIPS BETWEEN LIBRARIAN, LECTURER, AND STUDENT

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Abstract *It is the argument of this paper that the term information literacy, while a useful summarising code for central concerns of information professionals today, is one the utility of which may lead to over simplification. This, in turn, makes the goals subsumed in it more difficult to attain than they already are. We should be ready to constantly re-examine our own concepts and practice in relation to information literacy so as to remain sharply focused on what is effective in fostering information literacy in our own areas of responsibility. Simultaneously, we must be alert to the limitations of what we can do. By recognising the range and complexity of the scope of skills, abilities, attitudes and knowledge that the information literate person needs, we can define our contribution to the development of students' information literacy more effectively. In doing so, we also define the responsibilities of others for effective information literacy programs require team work among partners, all of whom are necessary to the attainment of that truly empowered person, the information literate. Indeed, effective information literacy programs require the cooperative effort of librarians, lecturers and students in their design, execution and evaluation and at least the endorsement, if not active support, of managers of teaching and learning policies and resources. A re-examination of the concept of information literacy makes clear why this is so.*

Everyone at this conference knows what information literacy is since it is the subject of the conference itself and your attendance testifies to your interest and your commitment to helping clients become information literate. No one here is a novice. But there is value in re-examining the basics as a strategy to refine and extend our thinking.

To begin the process, let us look again at that form of words outlining the concept which has been widely adopted since its formulation by the American Library Association Presidential Committee.

> To be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information ...Ultimately, information literate people are those who have learned how to learn. ... They are people prepared for lifelong learning ...[1]

Many may feel that this definition is so well known it is not necessary to quote it here, but the terms we use are often as important for what they conceal as much as for what it is they clarify. In the case of information literacy, we need to begin any exploration in regard to it by agreeing that whatever its limitations, it is the ALA definition which best represents our common understanding of information literacy. Besides, the value of participating in conferences comes partly from the new ideas and knowledge that we gain by listening to others, but more important is the opportunity that conference attendance gives us to disengage from normal activities to reflect on what we are doing and why. How does the ALA definition, which we all recite regularly like a mantra, actually illuminate and guide our practice? What is its value?

Its value is simply that it encapsulates in shorthand form the major steps of what has been called the information process by ASLA and ALIA[2] and the *Big six* by Eisenberg and Berkowitz.[3] It outlines a strategy for satisfying an information need the validity of which is evident in the similarity of its steps to those described in the work of other researchers.[4, 5] Its importance is also indicated by its adoption by the very professionals whose work it is to meet clients' information needs. This in itself also underlines the fact that the definition reflects a library based perspective to information literacy, a perspective based on the use of resources.

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The definition also serves to make visible to library clients and the public in general what it is librarians do. The energy that the library profession devotes to the promotion of information literacy is valuable self promotion as well as effort expended to attain professional goals. In her article, Behrens makes the provocative statement that in the 1980s, 'the adoption of the information literacy goal was the library profession's response to having its role essentially ignored or overlooked in the educational reform process'.[6] If you are tempted to wince at the suggestion of collective professional nervousness at being perceived as irrelevant, there is no need. What is most striking about the discussions in all sectors of society of the challenges generated by the information age is their unapologetically economic rationalist nature. The ideals to be attained at all levels of education by curriculum renewal and the provision of electronic access to information and communication are in every case argued as economically important. Other factors related to personal empowerment and democratic processes are cited, but the positioning of statements of commercial competitiveness and industrial need and their forcefulness make them undeniably critical to the promotion of information literacy in society at large. Two examples relevant to this country illustrate the point. The first is from *Australia as an information society*. This report to the Australian Federal Parliament opens with the observation that

> Calls for Australia to become a 'clever country' instead of being merely a 'lucky' one, or even an 'intelligent' one, as some have preferred, recognise that Australia has slipped behind other advanced nations in failing to use its intelligence/knowledge to produce brain based, high value added goods and services.'[7]

The concern to find an approach to using Australian intelligence and knowledge to restore the country's competitive ranking with other advanced nations is the premise that drives the rest of the two volumed report. More recently, Lepani began her article, *The new learning society: the challenge for schools*, with the statement that 'human learning in the 21st century will be as different from human learning in the 20th century as the microchip and neural networks are from the valve.'[8] She predicted that 'education in Australia and elsewhere' would be shaped by a number of trends among which she identified 'the importance of learning as a core capability in global competitive advantage' and the 'metamorphosis of the school as a "learning web", with linkages ... to industry'.[9] Thus the information literate person who is the ideal product of today's educational renewal is far from Renaissance man as represented by Leonardo da Vinci. Instead today's ideal is aligned with Microsoft man, Bill Gates, whose importance to us all lies not only in his commercial success and in his control over the information we use and how we use it.

The ALA definition of information literacy may also be extrapolated to create a series of standards by which to measure information literacy competencies. At this conference, the Head of the Reference Department of Florida International University Library and Codirector of the Information Literacy Initiative at the same university, Patricia Iannuzzi, will facilitate a workshop on a draft of Information Literacy Competency Standards. These have been designed for higher education in the United States by a task force of the Association of College and Research Libraries.[10] They represent an impressively logical analysis of the elements of an efficient information search that is carried through to the formulation of specific, measurable outcomes by which a student's achievement of a standard may be assessed. The explicit detail of the standards is a key sign of their potential use to anyone planning an information literacy program. However, they also illustrate the limitations of the original ALA definition that underlines them, and the limitations of the library profession's contribution to any information literacy program. In examining them, we confront what it is that librarians can offer to the development of information literate students and what it is others must undertake. This in turn makes apparent the need for partnerships between librarians and academics in the promotion of information literacy. Forging suitable and effective partnerships is the primary challenge for those who aim to promote information literacy.

The challenge

The information literacy competency standards for higher education drawn up by the ACRL Taskforce set out descriptions of characteristics of the information literate person and actions taken by such a person that would consistently result in the effective exploitation of relevant resources in the fulfilment of an academic task. But the measure of the success with which any particular student has followed the strategies and behaviours outlined in any particular case must be made on several different sets of criteria. Only in an ideal world do these sets of criteria coincide and only rarely do they match closely in the real one.

To illustrate the point, take, for instance, standard two: the information literate student accesses needed information effectively and efficiently. In judging whether any given student has met this standard, there will be the criteria of judgment applied by

- professional information workers eg the library staff
- assessors of the academic task eg the lecturer
- student, the person whose performance is being measured.

What the information professionals apply in judging the student's performance is set out lucidly and succinctly in the standards. Five performance indicators and 18 measurable outcomes, logically sequenced, are given. To illustrate the nature of the criteria used the first performance indicator and its measurable outcomes is

> 1 The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.
>
> *Measurable outcomes*
>
> The student
>
> a) identifies appropriate investigative methods
> b) investigates the scope, content, and organisation of information retrieval systems
> c) selects efficient and effective approaches for accessing the information needed.[11]

This example demonstrates how the standards are composed from the perspective of knowledge of what resources are available and how they should be used. This is judgment of efficiency and effectiveness calibrated against what the library professional knows and thinks is appropriate. This is judgment predicated on the aspiration that the student will exploit to the full the range of quality information available. It also assumes that quality information is critical to the attainment of success and that quality information is contained within the systems.

These assumptions, however, may not be those of the academic assessing the task. In a particular assignment, the main learning focus may be a task, which is only in a minor way dependent on the information used to construct it. For example, in a subject I teach, one of my goals is to teach the students the skills of report writing. Certainly, documentation and information of various kinds are needed for the assignment, but information gathering and evaluation are not as significant to the outcome as are other activities. Students are advantaged if they choose to write about a topic the content of which is already familiar to them. Secondly, in some assignments in higher education, the forms of information required will not be found in information systems. Thirdly, and this is a sensitive matter, one which has not been a problem for me yet but which has affected many colleagues, pressures of increased student numbers and flexible delivery may force academics towards practices which limit the range of student responses. Similarly, they may restrict the sources students use in order to ensure a more standardised learning experience and equal access to learning resources. Where 2 000 students are studying the one subject and are being taught by a team of tutors led by a subject coordinator, who is responsible for equity of treatment and access to learning resources, narrowing and intensifying of the focus of study may result. For example, students may be issued with set readings that are all that is needed to pass the subject. Such measures also help contain plagiarism. Yes, there are ways to track down student plagiarism but one has to balance the time spent against other goals such as giving more feed back to the student body in general. Thus the criteria employed by academics in assessing student use of information sources in assignments may not always fit well with those of information professionals.

In judging how information literate students may be, there are the criteria of success that the students themselves apply. In my experience, these are often wildly at variance with those of the library staff and/or the lecturer. Of course students want to get good results and gain their awards. They would not be enrolled if they did not. But many other factors beside the love of learning and the desire for intellectual attainment affect their every decision as students. For most of them, their application in relation to every assignment is a complex gauging of what is worth their time for the level of outcome they will be satisfied with. For most students who are progressing steadily through their degrees, most of the time, their use of information sources *is* effective and efficient, whatever library professionals and academics may think of it. This view of student attitudes to the use of resources is not a personal idiosyncrasy of mine. See for example Nimijean's observations of student preference for using a text that is more than 30 years old rather than something more up to date, and the students' reasons for doing so.[12]

If there is anything they think they may like to know about better access to information, it will be something quite specific. If they wish for higher marks, they rarely think that better use of the library will achieve that result. A wailing chorus of information professionals and academics, tearing their hair and rending their garments as they chant about the inadequacy of student levels of information literacy, will do little to change their practices. Students may mouth pieties about wanting to know more: the fact is most have learned how to learn to the point where it seems relevant to them. If we are going to change their practices, we will have to make it worth their while – in their terms, not ours. The first of our necessary partners in fostering students' acquisition of information literacy is the student.

The second must be the academic staff. There are two crucial aspects to their role. Firstly, they generate the information needs, which lead students to search for, select, evaluate and apply information. Let us not lose sight of the fact that the information need a student pursues to complete an assignment is a need imposed by an academic, not one genuinely felt by the student. Therefore trying to find out what it is the academic wants, rather than seeking an answer from all the possible answers generated by information resources is an intelligent choice by the student, not mere laziness or inadequacy. Consequently, the more closely the design by academics of curriculum and assignments can be informed by library staff in regard to resources available, the more likely the student use of information resources will be efficient and effective from both the lecturer's and the librarian's points of view. Secondly, academics are important because they mark student assignments. Unless effort in identifying, obtaining and using suitable resources is explicitly rewarded, students will not bother to continue such effort. They do what is necessary. If information literacy practices do not prove to be necessary, students, most of whom do not have the luxury to spend time on the merely interesting, will not persist with them on a regular basis.

The key to necessity as students see it lies in the rewards their instructors give them for their efforts. The conundrum for us is to facilitate a process of curriculum reform and assignment design that assists academics to

- identify the information experiences and processes necessary to achieve scholarly goals within their discipline
- design learning experiences and tasks for students who explicitly highlight these information processes and their proper application in the completion of assignments.

It is at the points of conceptualising what the goals of a course are and of its design to achieve these goals that the interface between scholar and information must be formulated as appropriate to that particular field of study. If this is done, then student use of information resources will be guided into fruitful modes of thought and action and rewarded in the outcomes of learning in an integrated way. Separate scoring by academics for use of resources is not a solution. It is but a 'tacking on' of an exercise that shows by its distinctiveness that the use of resources has not been integrated properly into the task.

The conundrum

Facilitating the process of curriculum reform in which experts from many parts of a higher education institution pool their knowledge to restructure and change student experiences of teaching and learning will be no small feat. Part of the conundrum is that the potential of the increased means of access to information over the past ten years has been countered by the changing teaching conditions in higher education. In the report on the information literacy initiatives undertaken at Ballarat last year, Radomski noted 'conditions of work in the tertiary sector emerge for us as a significant pedagogical issue'.[13] As discussed above, these have often led to teaching methods less likely to foster information literacy than those employed formerly. Another is that time is now everyone's most valuable commodity. None of us is prepared to spend any of it in activities that we are not convinced are substantive, constructive and of central importance to our own responsibilities. If the library staff are to be the initiators of information literacy projects, how do they engage the others whose cooperation is necessary for the success of the enterprise? I suggest they must start by gaining the support of a critical partner not yet mentioned: the leadership of the institution itself.

Professor Ken Haycock's presence at this conference marks the fact that there is widespread recognition among committed professionals for the need for partnerships in the pursuit of the transformation of higher education needed to foster students' information literacy. He played an international role in promoting planning partnerships in 'learning how to learn' methodologies in schools. His influence on the teacher librarians of this country in the second half of the 1980s and the first half of the 1990s was transformative. In many schools his work led directly to excellent programs designed and executed by teachers and teacher librarians jointly and led and supported by the principal. In others the language of cooperative program planning and teaching (CPPT) was adopted, but not the practices. The experiences of CPPT in Australia, both the successful and the failed, underlined the soundness of Haycock's original paradigm and those full partnerships between key people were essential to success. Where only one or two were willing and committed, only limited achievement was possible. And it was usually temporary, even 'one off' in some schools. The most innovative feature of Haycock's work was his insistence that the principal's leadership was critical to sustained progress. As the person responsible for the structures and resources of the school, only the principal could ensure that information literacy practices became embedded in the school's program and were not isolated instances in the classroom of an enthusiastic teacher.

At university level, the experience of pioneers in the field has shown the same principles to hold true there. Library staff can only do so much on their own. Individual lecturers or academic teams can have some success, but these are restricted to a particular subject or course and may easily be undermined by a change in staff, even the loss of a single person. If the way academics teach and students learn is to be transformed, then those institutions which regard teaching and learning as core business will have to tackle information literacy as part of core business. Academic leaders will need to make provision to allow for the redesign of curriculum and the adjustment of systems to support the new design and its implementation. Even at Ballarat where encouragement and some funding was available to support the new information literacy program, the progress made was restricted by the fact that no time provision was made to enable the inclusion of an entire teaching team in the planning.[14] Considerable institutional will and active support is necessary to address such matters.

Starting at the top is a daunting prospect. I believe, though, that any administrator concerned with the proper use of expertise and resources will respond to the evidence library staff can provide that much of their effort is expended in helping students find and use information where

- the resources are cited inadequately or are not even available in the library
- the task could be more effectively approached by the use of other sources than those cited
- assignments are of such a kind that students can do well in them simply by reproducing sections from standard texts.

While some examples of the above may be of no consequence, the scale of these practices suggests a serious mismatch between the goals of learning and the processes.

Yet the very trends in education which are responsible for some of the less desirable current practices also offer the opportunity for constructive change. Three examples from the University of South Australia illustrate this. The university has

1. appointed Deans, Teaching and Learning, with the responsibility of raising the overall standard of teaching. They will therefore have the potential to play an essential role paralleling that of the principal of a school
2. incorporated into promotion criteria for academic staff, recognition of the value of teaching according to the concepts of Ernest Boyer's *Scholarship reconsidered*.[15] This puts the role of teaching in a new context and judges it by new criteria. Good teaching has always been an important criterion for promotion, but because the criteria by which research is judged are more widely known and understood, research has weighed more heavily effectively in promotion
3. introduced a new kind of teaching award. It is, I believe, unique. The 1999 Supported University Teacher Awards are not for outstanding teachers alone, but designed to be attainable by many staff. In the same way as many staff can aspire to win recognition for their research efforts annually by meeting certain criteria, so staff now have a similar path to follow in regard to their teaching. The awards therefore have the potential to 'ratchet up' teaching practice across the university.

Each of these developments offers openings for information professionals to influence practice.

The solution

If Haycock offers a paradigm of partnerships and cooperative planning as a solution by which to integrate the library's contribution to information literacy into the general academic program, are there any models available to guide us that are in line with Haycock's ideas? Yes. There is no scope in this paper to discuss the work being done under Philip Candy's leadership at the University of Ballarat, but careful reading of

Radomski's[16] account of it, as an exemplar on an institutional scale, is essential for all Australians convinced of the importance of information literacy in higher education.

Success will be attained by those who work for the ideal whilst remaining pragmatic. For example, it is sensible to keep reminding ourselves that the way librarians tend to conceptualise information literacy will be different from the formulations of others. Because of the nature of their work in organising resources and retrieving information, librarians tend towards a view of 'information as thing'[17] and a metaphor of information processing as transmission of data from one person to another. In itself this will not matter provided they recognise the legitimacy of *other* constructs and adapt their views accordingly, where necessary.

We must accept that our efforts which result in course design that maximises student opportunities to grow as information literate persons will not guarantee that every graduate is information literate to the degree that we would wish or even deem appropriate. Bringing together the academic leaders, the resource and service providers, the teachers and the library staff will produce vastly more effective information literacy experiences for our students than those currently available. But every search for information may be represented as being composed of four elements, *the searcher, the sources, the context* and *the purpose*, and the infinite number of combinations of these effectively make all of them *situational*.

The Searcher	The Sources
The Context	The Purpose

The information incident

Many such incidents are part of the chain of searching that a student may carry out for a single assignment. The relationship between the factors will not stay steady: for instance, feeling hungry or tired will change the searcher as time passes and change the way decisions are made and on what basis. Even in general terms, the degree to which in any one case the student's assessment of the role and value of the task, the lecturer's and that of the library professional match will not often be high. But these matters, while significant, are simply reasons which underline the importance of partnerships and planning in the development of information literacy programs so that they can be as suited to the students' needs as possible.

Furthermore, we must be pragmatic in that none of our systems is perfect. To take a single incident that caused some frustration for staff and students, we can look at what happened when I set *Management 98/99* as a reading for an exercise this year. The reference librarians told me that most of their problems with reading lists generally come from them being distributed to the students before the librarians have a chance to see them. Additionally the citations may be incorrect or the items cited not even in the library, though academic staff have assured the students that they are (email communication, 6/8/99). In this case none of these conditions applied. The list had been forwarded to the library, the bibliographic details given to the students were correct; the item was held in the library, but because of the nature of the item, the entry in the catalogue was simply, *Management*. Consequently, if students went to the titles option on the Opac, they were confronted with 167 screens of titles beginning with the word, 'management'. If they were more skilled than many library users and used the option for journal titles only (always assuming they knew the title was that of a journal), they would have 11 screens to scan. Even then, there was no mention of the editor of the item, which was its only distinctive feature. So unless the searcher knew the title was published in Guildford, Connecticut (an unlikely scenario) they had no way of identifying the title from many other similar ones listed on the 11 screens. Finally, if the students had used the series option, and typed in *annual editions* they would have found the title very quickly. The evidence was, however, that very few of them, if any, did this. (The screens were accessed in August of this year. It is likely they would have increased in number, rather than diminished, since then.)

Finally, while seeking to enable our students to become independent learners, we should prevent them from undervaluing the expertise of the information professional. Part of making them independent learners should be to keep them conscious of the limitations of their own skills in searching information sources and retrieving them, so that they turn to the professionals at the right time. In April of this year, I received an email message from a student in England who wrote

> I am looking for a quotation by your ex Prime Minister that contains a phrase similar to 'Hope must be an essential factor in children's literature' ie we must give our children hope in the literature they read. It featured in an article on Australian children's literature written, I believe, by an Australian sociologist. Unfortunately, I do not have the name of the author or the publication/date. Can you help please?

The heading of the message was 'Quotation by Bob Hawke'. I was certain that the quotation was not by Bob Hawke but was not making much progress when Jenni Jeremy, Development Librarian of the Bob Hawke Prime Ministerial Library, offered to help. It was not more than three days later when she sent me the following message, which she also forwarded to England

> Quotation wrongly attributed to Bob Hawke. Actually Paul Keating, Dec 94, speaking about the need "to generate a deep sense of optimism within our young people" cited in Eckersley, Richard: 'The Culture of meaning, the meaning of culture' in *Magpies, Talking about books for children* Vol.12, No 2, May 1997.

I think you have to be a librarian to really appreciate how much professional ability was demonstrated by the speed and accuracy of that result. No one who knew *Magpies* as a journal would consider it a likely source, given the clues provided. The quotation was not part of the main text, but merely a box at the side of the article.

Jenni's own account of how she found the answer (email to author 28/9/99) exemplified how much the successful pursuit of an obscure question depends on experience, knowledge and expertise at a professional level that we can never expect to train a student to reach in an induction course. To aim to do so would demonstrate a severe lack of appreciation of the skill and ability of librarians who are constantly engaged in the research process. It seems to me that no professional group sells its own expertise so cheaply as do librarians, that they do this by their stance that they can easily train people to be self sufficient in their searching and, consequently, librarians are their own worst enemies.

Next year I hope the program which the library provides for the research students in my school, more than 40 in number, will be refined to ensure that they receive a training that assists them to work on their own in preparing their literature reviews. But the program must also be designed to require them to discuss their progress in finding sources at intervals with a specific librarian. I expect that the program's revision will be a joint project of the library staff, the Dean, Research Degrees and myself as Local Research Coordinator. We will aim to shape a program that puts into practice some of the ideas proposed by Peter Macauley and Sue McKnight, of Deakin University Library.[18] Macauley and Knight argue that librarians can assume the role of co supervisor, at least during that part of a student's program where s/he is preparing the literature review. In acknowledging their ideas, however, I want to address directly a concern voiced by some librarians about such a model. They fear that it represents 'spoon feeding research students'. Macauley and Knight state that most librarians believe that they should provide fishing rods rather than fish.[19] Such a fear reveals the gap between library based and academic concepts of information literacy. Simply having quality information sources to hand is not in any way a guarantee of the outcome of the research. To conceptualise the assembly of information as handing students the product and not the means to the product is to misunderstand what the research task is, no matter how good the information in question. In fact, here is a confusion probably based in the use of the term research for information retrieval. Information retrieval is only research at an elementary level. It is not research in any sense as done by a person whose academic award will be for research. A librarian cannot do too much for a research student. At the same time, the value of what the librarian can do should be properly valued.

There is room for many approaches in the campaign to transform teaching and learning in higher education. But the work of Professor Ken Haycock and the projects undertaken at the University of Ballarat provide

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substantive theoretical and practical grounds for approaching improvement through partnerships of administrators, academics, librarians and students. Careful planning, cooperative effort and continuous evaluation will be necessary if more than spotty success is to be achieved.

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GETTING INFORMATION LITERACY INTO THE CURRICULUM: THE ON GOING DILEMMA, AND HOW TO BE INVOLVED WHEN YOU ARE ON THE EDGE

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Abstract *Integrating information literacy into the curriculum takes persistence. One good meeting or an idea mentioned to academia is certainly not enough. To fully advocate and develop as a contributor to tertiary information literacy it is, from experience, an ongoing dilemma. Added to the dilemma for us at Victoria University of Technology (VU) is the reality of the unit, Ways of knowing, being taught to first year arts students at multiple campuses, having multiple lecturers, multiple tutors, and multiple librarians teaching the unit. The assessable library components of the unit have evolved over the last six years. Currently the components have undergone a renaissance, as some of the librarians were involved in studying for a Graduate Certificate in Tertiary Education. Thus much of the newly acquired knowledge of teaching and learning theories, and methods of portraying information were integrated into the teaching of the unit. Subject evaluations of Ways of knowing relating to the library component have generally been rather critical. This feedback has been important as a tool for consideration in future years of how to improve the library component. This paper outlines the evolution of the unit, the on going dilemma of keeping the unit relevant and integrating the unit with multiple presenters, contributors and across campuses.*

The Library has been involved with a compulsory subject with the Arts Faculty since its design in 1992, and originally it was hailed as a success story of course integrated library instruction. In 1991 several librarians met with members of the Concurrent Support (later known as Student Learning Unit) Team to discuss the problems some (mostly first year) students were having in meeting the expectations of lecturers with regard to library use. This issue was brought up at an Arts Faculty Board meeting, resulting in the preparation of a paper setting out guidelines for appropriate levels of information research skills for students. There were several enthusiastic people within the faculty that helped drive this along.

At about the same time the Faculty had identified a need for a separate compulsory skills subject to be taught to all first year Arts students. This subject, called *University and community*, was to teach skills within the context of topics related to the community. The Library was invited to participate in curriculum design for this subject. Emphasis was placed on teaching information skills that were timely and appropriate to student assessment. The assessment pieces were designed to be appropriate to the information skill level required.

During the mid 1990s the university environment changed, subject coordinators changed and somewhere we lost our way. Suddenly the library sessions were integrated only to the extent that they were held during tutorial times. This is hardly a unique experience and demonstrates a similar experience to Rader[1] who also found that earlier successes had not lasted. A change in the curriculum, the departure of a faculty member or time constraints within a particular course have often eliminated the integrated information/research skills module taught by librarians. During this time at Victoria University new campuses were opened with courses which began and then were consolidated and moved to different campuses. This chopping and changing had its impact on the connection librarians had with the lecturers at different campuses teaching the first year Arts compulsory subject.

By 1996/7 the first year subject, now called *Ways of knowing* was only partially integrated with library sessions in that they coincided with an assessment task requiring minimal information research. Evaluation of the library sessions showed there were problems with the timing and the relevance of these sessions.

The Library underwent two review processes in 1996-8 and an outcome of one of these was a higher profile for information literacy and the recognition of the work already being undertaken by subject liaison librarians in user education classes. In 1998 a library working party on information literacy was formed. They

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recommended the formal integration of progressive information literacy education into the curriculum of every faculty and school. It was acknowledged in their report that for this process to be effective there needs to be commitment from all university stakeholders. This report gave us inspiration and hope for the future. However another amalgamation with a large TAFE Institute put the efforts of this working group on hold.

The library review also put the spotlight on librarians' teaching qualifications, or lack thereof. A timely inspiration of the University's then Centre for Professional Development in collaboration with the University's Department of Education, was to develop a Graduate Certificate of Tertiary Education. A number of library staff were encouraged to participate in this course, with course fees paid for by the University.

With three of the librarians involved in *Ways of knowing* also doing this course, some major initiatives were implemented during first semester 1998 (the course only started in February). The course encouraged reflection on current teaching strategies, aided by an understanding of teaching and learning theories. The key points identified in the reflective process were that the library sessions

- covered too much
- were either too early or too late
- not tied to assessment
- students found them boring.

The changes implemented during 1998 were

- including an active learning component
- covering less information
- introducing explaining modules that focused on getting the key points across
- using PowerPoint for presenting and introducing a library assignment which thankfully the coordinating lecturer agreed to make assessable.

Requiring students to communicate their ideas promotes learning[2, 3, 4] Students completed an assignment based on the library sessions which was assessed and graded by their tutor. Like Orians,[5] we also knew that many students take the path of least resistance and would not take the work as seriously if they were not held accountable; thus the assignment that was developed was worth ten per cent of the students end of semester assessment.

The subject evaluations in 1998 were critical of the library assignment with some finding it tedious and wondered why they had to do it, but anecdotal evidence via the Information Desk showed that students seemed to have a better grip on using the library than in previous years. However, the library sessions still lacked context as the subject assessment (apart from the library assignment) and did not require any information research. It would seem that the economic deterrent of paying tutors to mark essays resulted in the assessment comprising summaries of set readings and a multiple choice exam, based on lectures and set readings. The fact that within this subject students were not required to do library research would not have been such a problem were it not for the fact that in most other first year Arts subjects students were also only doing assessment tasks based on lectures and readings. Lecturers were unaware that their colleagues in other subjects were all moving away from setting essays as assessment tasks.

The ongoing dilemma

Various studies during the past several decades have shown that the courses, not the students, are the determining factors in the degree to which a library contributes to the academic programs, specifically the curriculum. Students will obtain necessary library and information skills through appropriately planned coursework determined by faculty, their attitudes, and teaching methodology. Librarians' involvement in curriculum planning and cooperative teaching with faculty will help students develop important and vital information skills, and faculty will value such involvement.[6]

Several library instruction surveys throughout the 1980s indicate that successful integration of library and research skills instruction into the academic curriculum was rare. Where integration has been successful, several key factors were present

- library administrators had long term commitments to integrate library instruction into the curriculum
- librarians and faculty worked together in curriculum development

- the institution had a strong commitment to excellent educational outcomes for the students in the areas of critical thinking, problem solving, and information skills.[7]

In 1999 a review of the foundation subject by the Faculty was to be undertaken. It seemed that the Library was to be excluded from the process as the review team was composed of department representatives, student representatives and a member from the newly formed Centre for Educational Development and Support (CEDS). A study conducted by Jean Major identified factors contributing to librarians' acceptance as colleagues by teaching faculty that the most important factor was self confidence as a librarian.[8] Utilising this self confidence and through persistence, questioning and ultimately working closely with the CEDS person, the Library tabled a document at the Foundation Subject Reference Group meeting which has been largely accepted, and will be integrated into the curriculum. The document focused on assessment tasks. The six information literacy competencies suggested by Bonnie Gratch Lindauer[9] (see Appendix 1) were also tabled to the Faculty.

Although aspects of collaboration are not new to libraries, a cooperative mode of teaching requires a major conceptual shift for those accustomed to a competitive managerial mind set. The business literature discusses the new model of a corporate leader who is moving 'from the sage on the stage to the guide on the side'. This is one of the basic tenets of collaborative learning theory and what every instruction librarian applies in the classroom on a daily basis. [10]

Starting with the basis of collaborative learning theory and the principle that assessment drives student learning the basis of the document tabled to faculty suggested that there should be an assessable assignment in first semester designed to develop information literacy skills with an assessment piece in second semester which requires students to develop at least some of the elements of all six information literacy competencies listed in appendix 1. It is planned to move towards using the web for posting lecture notes, readings, information sources, self paced information skills tutorials and also an online discussion forum. In other faculties the library is working in partnership to develop web pages for subjects. A variety of delivery methods for the library component are being considered such as workshops in library during tutorial times mostly hands on, a presentation as part of the lecture program, and potentially making use of student circles for follow up sessions in both semesters one and two, for example, a group of students making an appointment with a subject liaison librarian.

It is planned that a third hour of lecture time would be timetabled which would be used as a parallel session taken by a CEDS person. The focus of these parallel sessions is to assist students to complete assessment tasks. The Library will offer voluntary sessions in addition to the integrated tutorial sessions in this time ie the same hour each week, but not every week, to help those in need.

The future: a brave new world?

There is much work to be done over the next few months as we seize the opportunity provided by curriculum redesign to completely rethink our approach. We plan to have several meetings with all library practitioners involved in teaching the course, as well as the CEDS representative, to attempt to draw together a best practice approach. We also will keep in close contact with the key lecturers as we chart our new direction.

Our experience has shown that we cannot ever rest on our laurels of achieving course integrated library instruction in a subject. It takes persistence, and it often takes a bit of gall to suggest to academics how they should design their subjects. All of this adds to the ongoing dilemma in making the course and information literacy involvement fresh and relevant.

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Appendix 1: Information Literacy competencies presented to the Foundation Subject Reference Group

Develop effective search strategies

1 Student determines the information requirements for the research question, problem, or issue

2 Student determines what category of information resource is most relevant to the information need develops a plan to search for needed information

Locate and retrieve information sources

1 Student correctly interprets bibliographic citations and Internet equivalents and knows how to obtain cited items

2 Student uses interlibrary loan, document delivery, electronic transmission, or other means to obtain material not available locally

Analyse and critically evaluate information

1 Student analyses and critically evaluates the results of a search for accuracy, relevance, timeliness, authority, etc

2 Student filters large amounts of information and distinguishes among facts, points of view, and opinion

Organise and synthesise information

1 Student synthesises information from a variety of sources and organises information for practical application

Use/apply information

1 Student applies information to critical thinking and problem solving situations

2 Student communicates using a variety of information technologies

3 Student integrates information resources into academic discourse

4 Student produces and communicates information in effective and appropriate formats

Awareness and attitude formation about information and information technology

1 Student is aware of the ethical, legal, and socio political issues surrounding information and information technology, such as copyright and the responsibility to properly credit information sources

2 Student appreciates that the skills gained in information competence enable lifelong learning

3 Student is aware of the difference between information and knowledge

4 Student is aware of the structure and dissemination channels of the global information environment

INFORMATION LITERACY AND HEALTH SCIENCE: DEVELOPING A COMPREHENSIVE AND SUSTAINABLE MODEL

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Abstract *In 1997 staff at Central Queensland University (CQU) created a model to deliver generic skills, specifically information literacy and communication skills, to students enrolled in a core unit of the Bachelor of Health degree. The unit was offered in distance mode and across three campuses using videoconferencing. The teaching team included three academic staff, the Faculty Liaison Librarian and a lecturer from the Communications Learning Centre. Evaluation of the unit, including student surveys and informal observations on the impact of the student queries on the reference desk and the offcampus library service, indicate that the project was very successful in terms of enabling quality learning outcomes for all students.*

In line with national and international trends, which focus on lifelong learning and the recognised need to incorporate information literacy skills into the curriculum, user expectations of the Central Queensland University (CQU) Library have changed. Increasing numbers of academic staff have requested concept based information literacy education rather than the skills based training offered in the earlier reader education classes. In 1996, academic staff associated with the health science program recognised the need to incorporate, and make explicit, a number of core skills into the curriculum, especially within the foundation units. A 1997 University Teaching Development grant provided development and preparation time for the rewriting of the unit, as well as staff teaching time.

Trends in higher education

As evidenced in several commissioned reports and government publications, there has been a push within the higher education sector for educational reform to promote lifelong learning and to implement student-centred teaching, learning and assessment. Lecturers want their students to learn how to analyse what is unfamiliar to them, to assess proposed solutions to problems critically, to recognise the style and persuasiveness of concepts that describe the physical or social world, and to be able to apply ideas learned in formal classes to the world outside the classroom.[1] The creation of a learning culture which produces graduates with a capacity and desire for lifelong learning in a rapidly changing, complex, and information abundant environment, requires a major shift in the educational paradigm.[2]

The NBEET report, *Developing lifelong learners through undergraduate education*[3] identifies information literacy as one of five essential elements of the undergraduate curriculum. Effective research, learning, communication, decision making and problem solving, require individuals to be able to locate, manage, evaluate and use appropriate information from a wide range of formal and informal sources. This emphasis indicates that in Australia as well as internationally, information literacy and information literacy education are relevant to quality research, quality teaching and learning, and quality information environments.[4]

Also significant is the trend to recognise prior learning and experience acquired by students in other contexts. Through a commissioned report, an Australian Vice-Chancellors' Committee (AVCC) Working Party aimed to establish the extent to which Australian universities recognise uncredentialled learning. That is, the learning acquired through practical experience such as on the job or through life experience.[5] It is argued that life experiences are fundamentally important to both the way a student engages with content and the way they perceive their learning situation and approaches their studies.

Trends in higher education have provided university libraries with an unprecedented opening to foster educational change, and for which there will be a high opportunity cost if the challenge is not grasped. Concern centres around what should be the educational outcomes when the growth of knowledge is such that the curriculum could always be behind, and when students are, or should be, developing the aptitudes for a lifelong of learning.[6] While educators and librarians are quick to recognise the importance of information literacy skills and the need to alter the educational paradigm, not a lot has been published describing the processes and outcomes of such an integrated approach.

Trends at CQU

Like other Australian universities, CQU has articulated a commitment to information literacy and other generic skills. The Information Literacy Philosophy (Appendix 1) has been developed by the CQU Library, and shows how the student is central to all learning and teaching activities. New students are drawn from a variety of cultural, economic, educational and social backgrounds. Ages vary, as do prior learning experiences and expectations. Once enrolled at CQU a student can choose units from a number of courses and usually complete their study in a mode that suits their needs. Gravitating around the inner circle are the attributes it is hoped each student should develop before graduation. They include the ability to

- apply discipline related theory to practice in both familiar and unfamiliar situations
- solve problems and to apply scientific reasoning
- use information technology
- be information literate
- function effectively as team members and team leaders
- communicate ideas both orally and in writing.[7]

As depicted in Appendix 1 the attributes listed on the *Teaching and learning strategy statement* are interdependent and information literacy skills cannot be developed in isolation. There is an especially strong link between the development of information literacy, problem solving and technical skills. Although core skills are not tested or demonstrated, the model assumes that students arrive at CQU with sufficient skills to cope with higher education. Further development of skills is not a strict linear progression through various stages but rather an interactive and dynamic process unique to each individual. The outer circles show how concepts and associated skills need to be identified, the processes (classes, infoguides, web tutorials) for achieving desired outcomes need to be discussed and before an individual can achieve competency there must be evidence of application.

Health and the community

Academic staff responsible for the unit called *Health and the community* recognised the importance of all the attributes outlined in the *Teaching and learning strategy statement*. *Health and the community* is a first term foundation unit for three degree programs (Nursing, Health Promotion and Occupational Health and Safety), and examines health in its historical, cultural, political and socioeconomic contexts. This unit was offered in both internal and external mode. A fieldwork component encourages students to link health with community, in both a conceptual and a practical manner. Although all staff were committed to teaching generic skills, particularly information literacy and communication skills, the challenge lay in developing an appropriate delivery model.

Developing a model

Staff aimed for a fully integrated unit whereby the process of seeking, evaluating and using information was fully integrated with the content and consequently into all students' experiences. This philosophical approach allowed the use of information to become part of the learning process, as opposed to yet another requirement or an '"add and stir" solution'.[8] To achieve the desired outcome it was necessary to capitalise upon the knowledge and experience of several professionals. Since responsibility for the creation, delivery and assessment of the content was shared and success depended upon combining individual contributions in a meaningful and holistic manner, this model became known as the community based model.

All participants were involved in the decision to use the community based model. In reality the group functioned as a self managed team which was based on the integrated performance of a variety of skills needed to transform a service within the workflow rather than a functional work group.[9] While the team had a common goal it was the personal and individual skills of each team member coupled with a willingness to share, collaborate and learn from the unique contribution of each team member that led to the success of the model.

The community based model and information literacy

In preparing the information literacy component of the program, members of team used the CQU Library Information Literacy Framework. As a starting point, this framework articulates the principles that encapsulate information literacy at CQU. These were adapted with permission from the SUNY *Information Literacy Competencies 1997*[10] and include

1 recognises the need for information
2 develops skills in using information technologies
3 accesses information from appropriate sources
4 critically analyses and evaluates information
5 processes and organises information
6 applies information for effective and creative decision making
7 generates and effectively communicates information and knowledge
8 understands and respects the ethical, legal and socio political aspects of information and its technologies
9 develops an appreciation of the importance of lifelong learning.

Each principle was then defined by a number of learning outcomes which the student will be expected to achieve. For example, the third principle is defined by the following learning outcomes

General principles of information literacy	The student should be able to ...
Accesses information from appropriate sources	Understand how information sources are structured
	Recognise and select a variety of potential sources of information
	Understand and use library catalogues
	Understand and use electronic databases
	Understand and use the WWW
	Understand and use discipline based resources
	Develop efficient and effective search strategies
	Effectively expand or narrow a search as needed
	Consult experts for assistance/guidance when needed
	Identify and retrieve information relevant to the question/need

The team discussed the various learning outcomes and ascertained which were appropriate to this group of students. Desired learning outcomes were highlighted and preparation centred upon the process of achieving these outcomes. Regarding the internal students, it was decided to give each member of the teaching team equal time within the weekly lectures – one third of the time was devoted to content, one third to information literacy and the other third to academic writing. In the majority of cases, the information literacy component of the lectures dealt with concepts and issues, though web based demonstrations were also included.

Delivery to distance education students required that all distance education materials were rewritten, and included 'Margie's Corner' (the information literacy component) in each module. Information literacy concepts pertinent to the content of each module were identified and developed. Related information literacy activities were also incorporated into each module and as with all unit activities (in a workbook format), these were marked. Significant activities were graded while supplementary ones were given a pass/fail rating.

Delivery of *Health and the community*

In 1998, *Health and the community* was offered to a total of 249 students. One hundred and eighty one were enrolled internally (in Rockhampton and Bundaberg) and 68 as distance education students. In 1999 there were 172 students (139 internals and 33 distance education). The offering was expanded to the Mackay campus, and lectures were delivered from Rockhampton to the regional campuses by videoconference. In both years, distance education students were provided with traditional print resources.

The teaching team met on a weekly basis to prepare the week's lecture and tutorials. With multicampus delivery, using interactive technology such as videoconferencing, preparation and information sharing was vital.

Tutorials consisted of content related discussions and activities, as well as information literacy related tasks. Specific tutorials were also conducted in the library to provide opportunities for database searching. These tutorials were conducted across all campuses.

Students were required to submit a workbook at three stages during the term. The first submission was purposefully placed early in the term to provide formative feedback as a mechanism to allay fears and build confidence in undertaking tertiary studies. Workbooks consisted of a series of cumulative activities based on content, information literacy and academic writing. All the activities were assessed on either a graded or pass/fail basis. A major essay was the final piece of assessment and the marking criteria for the unit as a whole included a focus on information literacy.

Surveying the students

In September 1999, 418 *Health and the community* students, from 1998 and 1999, were sent a one page survey. Ninety eight (53 per cent) students from the 1999 group responded. Of these respondents, 70 (38 per cent) had completed *Health and the community*, and only their responses were analysed. Three questions were asked

- Was the integrated teaching approach used in *Health and the community* useful?
- Have you been able to use ideas or strategies from *Health and the community* to find information for other units?
- What are your concerns/feelings about using information for your studies this term?

It was decided to separate the analysis of responses by year, in an effort to determine if the transferability of concepts/skills altered over time. This did not seem to be apparent, although the poor response rate from the 1998 group could have affected these results.

Evaluation of the integrated teaching approach: 1999 students

Most students were very positive about the unit, with 61 (87 per cent) finding the integrated approach useful.

Comments included

- *The library content of the session made the difference between pass and fail as far as I was concerned. Very helpful and well delivered. Helped form successful research practices. (99m1)*
- *I gained a lot of information and ideas from the librarians and library tutorials which I would otherwise not have known how to access. (99b5)*
- *I feel that using the librarians for this subject is essential. (99r31)*
- *The unit helped me to both understand the unit content and use library facilities with some accuracy. (99r47)*

There were nine (13 per cent) negative comments and these fell into three categories: those who found the format did not allow enough time for the three elements within each lecture, those who felt that they already knew the skills/concepts outlined in the information literacy/academic writing components, and those who did not see the value of the information literacy component (only one student stated this). The needs of students who enter this unit with higher levels of information literacy skills and subsequently get bored with introductory concepts are currently being addressed. Specific negative comments include

- *During lectures it was confusing going from one lecture to the next, although it was helpful.*
- *I felt that the subject concentrated too much on writing styles and research materials and not enough time on subject. (99r12)*
- *I felt it drew attention away from the subject and wasted time. We could have done something like that in O-week. (99r21)*

Transferability of skills: 1999 students

Sixty two (88 per cent) students commented that they had used strategies learned in *Health and the community* in subsequent units. No specific comments were given by the students who responded in the negative to this question.

They commented

- *I refer back to 'Margie's Corner' regularly as I sometimes forget some of the points that were made which helped me previously. (99d5)*

- *Use of library skills have proved valuable in the researching and accessing of information required for other subjects. (99m10)*
- *I thought that the ideas and strategies from H&C were and have been useful in locating and using information for units this term. (99b8)*
- *Although I found it frustrating at the time it does come in useful in term 2. (99r12)*

Confidence in using information: 1999 students

Respondents raised two major issues when asked about their concerns or feelings regarding information use in their current studies. The first centred on the lack of resources, mainly at the regional campuses. This is an ongoing concern and issue for all, and is something that the Library is attempting to redress. The second issue reflected the difficulty associated with using journals and electronic databases and the need to constantly update the skills needed to use electronic sources effectively. This seems quite a realistic concern for first year students, and highlights the need for continued delivery of information literacy across the degree structure.

Comments included

- *Not having enough resources in the library for everyone. (99m15)*
- *I still find searching for journal articles a difficult task. (99r12)*

Student responses from the 1998 group were overwhelmingly positive, although the response rate to the survey was very low. Twenty eight (12 per cent) respondents, as stated earlier.

Evaluation of the integrated teaching approach: 1998 students

All respondents found the integrated approach useful as the comments indicate

- *I wished that I had completed this unit first as it made everything much easier. It was a bit like a light being turned on — I was able to gather and utilise information more efficiently. (98w2)*
- *It provided the basis to build and expand my knowledge when looking for information regardless of the subject. It is transportable knowledge. (98r10)*
- *Not only use it but it also helped me improve my grading markedly. It has also helped me assist my sister who has just started a university course by external study. (98w2)*
- *I am more confident using the library facilities and am able to ask for help when I need it. (98d6)*

Transferability of skills: 1998 students

All but two students had used strategies and techniques from *Health and the community* in their current studies.

- *H&C very useful study guide. Used many times in other assignments. It required a lot of thinking but it has benefited this student in the 'long run'. Hope the subject does not change for future students. (98d7)*
- *I feel confident searching for and using information for my studies this term thanks to the information literacy gained during H&C. (98r13)*

Confidence in using information: 1998 students

When asked to comment on their feelings and concerns about using information for their current studies, the students generally commented on their confidence in locating and using information. They also provided useful feedback about collection resources, reflecting their more advanced use of information sources.

- *I can say that I'm confident in searching for information and then using them if appropriate. (99w5)*
- *No problems, I now have the confidence and if I require assistance the library staff have always been more than helpful. Thank you. (99r100)*
- *Many of the subjects appear to be focused on Australian issues and from my experience there appears to be a shortage of relevant literature covering these issues. (99r15)*

Evaluation by teaching team

From the perspective of the Faculty Liaison Librarian, the team approach was highly effective. The team provided support and scaffolding so as to enable participation in the teaching process. The increased involvement with the students, over the period of the term(s), was also highly valued. This allowed the Liaison Librarian to identify and address problems, concerns or issues (both cognitive and affective), as they arose throughout the term, and beyond.

The team approach also allowed the participating academics to develop their own information literacy skills. From an academic perspective it required a broader focus than just the content regardless of the abstract or conceptual nature of the unit. The idea of skilling up in information literacy for both academics and students was to take the competencies learnt and transfer them to other contexts. Academics involved in this unit found that the active participation of the librarian in all aspects of the unit preparation and delivery created a learning environment where these skills became useful in other teaching domains, research activities and in the general promotion of these skills to other colleagues. It became a model that was seen to be useful as a curriculum wide project. This situation is yet to come to fruition although there is positive intent for this to occur. It is hoped that this will lead to greater academic delivery of information literacy skills in the future.

On this occasion, because of the personalities and teaching styles of the individuals, the community based model worked exceptionally well. Everyone recognised the contributions of each other and they were willing to collaborate and share. This model would not suit everyone and it is important to assess personal traits as well as desired learning outcomes when selecting a model.

Future directions

Feedback from students and staff indicated that the community based model used in *Health and the community* was effective in terms of enabling quality learning outcomes. Coverage of specified concepts and skills was comprehensive and the majority of students stated that they could see the purpose behind learning such skills and could transfer them to other areas. Although the initial investment in terms of staff time and energy was high, it is expected that these costs will decrease over the next few years resulting in an economically sustainable model. Academic staff have expressed a desire to teach the information literacy component making it likely that the contribution of the Liaison Librarian will be reduced significantly. Economies of scale will also be enjoyed as the model, which is now highly developed and includes a range of teaching resources, is transferred to other disciplines within the University.

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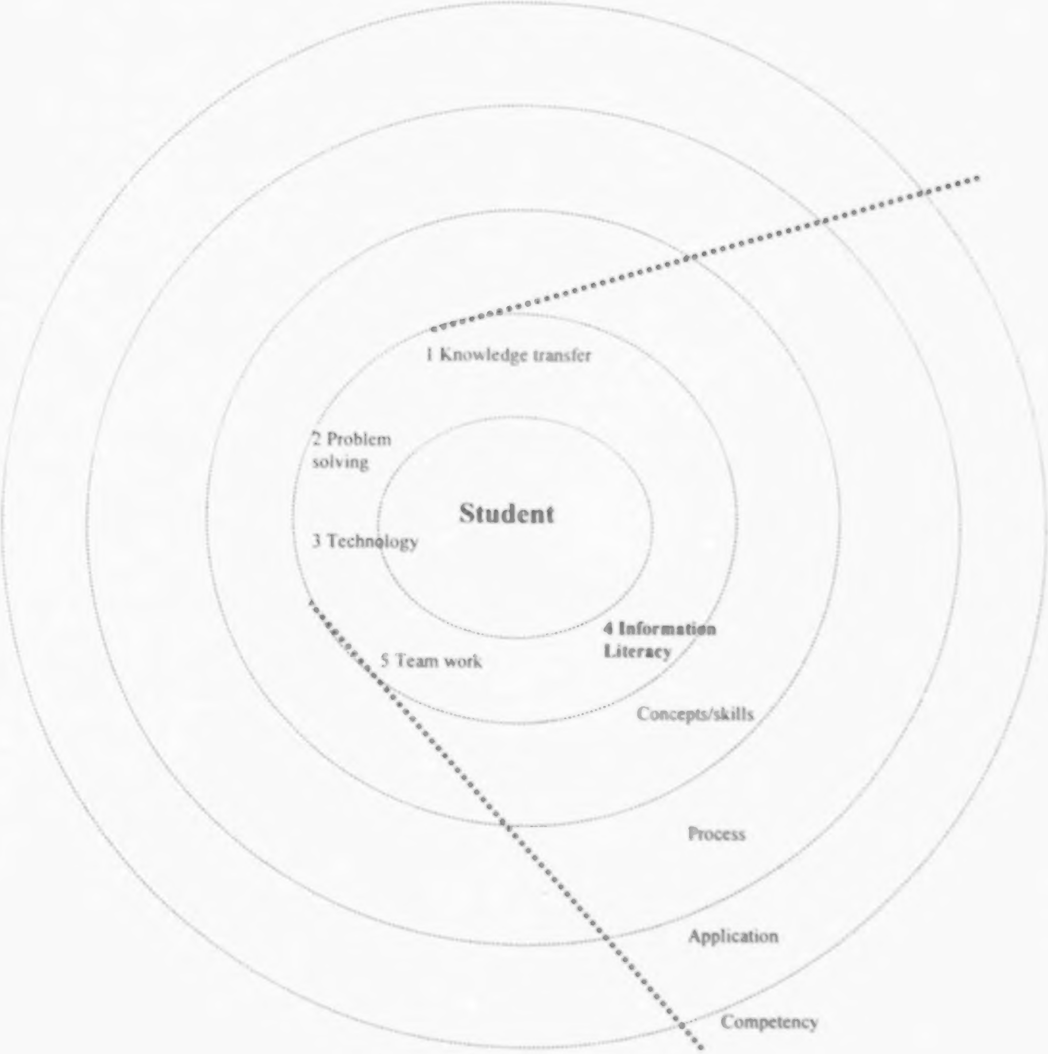
APPENDIX 1 CENTRAL QUEENSLAND LITERACY PHILOSOPHY


1 Knowledge transfer
2 Problem solving
Student
3 Technology
4 Information Literacy
5 Team work
Concepts/skills
Process
Application
Competency

PROFILING AN INFORMATION LITERATE LAW FIRM

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Abstract *This paper examines the profile of an information literate law firm. Lawyers work in an information rich profession, which means that information literacy is crucial to successful practice of the law. The law is contained in massive amounts of written material, and finding, interpreting and applying the law requires special research and analytical skills. Advising on a legal and commercial solution to a unique problem requires yet another set of information related skills. Lawyers not only require access to vast amounts of information, but in turn they create vast amounts of intellectual property. The profile of an information literate law firm is explored both from an organisational viewpoint and from the viewpoint of an individual lawyer. Organisational issues include understanding the various types of information that the organisation uses and creates, technical support, systems and processes that enable effective capture and storage of information, processes that reward effective use, reuse and sharing of information, training programs, library services and more. Information literate individuals need to understand and use the organisational systems at their disposal, they need to be responsible for their own learning, and they need to contribute to the organisation's learning. Understanding what it means for a law firm, and its staff to be information literate is the first step in developing a corporate information literacy strategy. A corporate information literacy strategy touches on many aspects of the firm's business and can effectively demonstrate that information literacy is not purely a library issue.*

There are many profiles of an information literate *person* in the literature about information literacy. The American Library Association definition of information literacy describes information literate persons as

> Those who have learned how to learn. They know how to learn because they know how knowledge is organised, how to find information, and how to use information in a way that others can learn from. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision.[1]

What then is the profile of an information literate *organisation*, specifically a law firm, and how can we describe the organisational characteristics, strategies, and priorities that signify information literacy in a business of this sort? In the process of answering these questions, observations are made about information literacy, its relevance to professional service organisations and its relationship to management practices and trends.

Like many modern workplaces, law firms are in the business of selling solutions. These solutions are heavily dependent on knowledge (the law) and know how (the practice of law). Information management extends across all components of legal practice. It is fair to say that lawyers are probably more information driven than any other profession, except librarianship itself.

Legal knowledge
Focusing first on legal knowledge, the sheer volume of material that makes up essential, or what is often now termed 'black letter' law, is staggering. This exists in statutes, regulations, by laws, determinations and rules. It exists in guidelines, codes, standard forms and policies. And it exists in decided cases, and the orders and directions of judges. Another set of complex legal rules tells us how we can view and use the essential material, how we interpret legislation and how we apply cases. At a further level there is legal philosophy, which underpins the constant and vitally important critical analysis of the legal system. All of this is legal knowledge, and all of this knowledge is constantly evolving with society: being created, refined, reformed, amended, overruled or repealed.

Because of the constantly evolving nature of legal knowledge, timeliness is crucial. Updating tools and services are an essential part of legal practice. Accuracy is equally crucial. Missing an amendment to a piece of legislation changes its meaning. Sloppy research is not just embarrassing, but potentially expensive.

The mountain of legal knowledge is really only the beginning. It is what underpins a lawyer's work, but the work starts and ends with a client's need. A vast quantity of additional information, and a vast range of skills are involved in legal practice. It is an exacting profession, and as the demands upon lawyers and the size of transactions increase exponentially, so too do the dangers of professional negligence.[2]

Lawyers' skills

So what are the skills of a lawyer? Not only must they know the law and the rules governing its meaning and use, they must also

- understand the clients position, the facts, the relationships and the potential liabilities
- identify the relevant law
- explain the law in terms that their client understands
- find solutions (commercial, legal and sometimes even political) that meet the client's needs
- communicate with and develop lasting relationships with clients
- market themselves and their practice to new clients
- manage their business and the people involved in it.

Most of these skills directly involve using information and require high level ongoing information literacy.

Information literate organisations

The purpose of this paper is to explore what attributes an information literate organisation must have, and at the same time establish what environment needs to exist for lawyers to give superior legal services and for the organisation to maximise profit. A useful way to approach this is to examine the profile of an information literate law firm. This could be defined as

> an information literate law firm manages its intellectual property so that it is a competitive and profitable business and ensures that its staff have the capacity to stay up to date and provide timely, accurate, relevant legal services.

In order for a law firm to become and remain information literate, a number of prerequisites exist

- Information produced by the firm and knowledge held by individuals is captured and reused
- The firm knows how it makes a profit and uses its structures and procedures to maximise profit for the future
- Staff understand what information and knowledge mean to the firm
- The firm enables and encourages staff to do their jobs efficiently
- The firm has information literate staff.

Capture and reuse of intellectual property

Capture and reuse of intellectual property is a very broad concept and one which requires organisation wide systems and processes and an up to date technological infrastructure. It is analogous to a university student making useful notes, and filing articles used for assignments, or using referencing software, to keep records of sources consulted so that he or she does not have to repeat research previously carried out. For an organisation, it means that when documents are created, or advice is given to clients, that information is captured and then reused.

The types of information a law firm creates is not limited to discrete pieces of legal advice, or contracts written by employed solicitors. Certainly, these types of information are very valuable for a law firm, and appropriate capture, storage, access to and reuse of them will save both time and money. Beyond this, an information literate organisation will recognise that information such as a client's background, profile, history of dealings with the firm, satisfaction levels and other client related information that exists in people's heads, or in various databases or files in the firm, is all information that has value to the firm if it is accessible, actively gathered, and reused in appropriate situations.

Information about staff also needs to be captured. Who speaks which languages, what legal and nonlegal skills exist in the firm, who has experience on what types of transactions or in which jurisdictions is all relevant information that an information literate law firm will recognise as valuable, and will be able to find, store and retrieve so that the organisation can use it to gain a competitive edge.

Financial information and other information that goes to profitability is obviously highly relevant to the firm's business, so much so that it is addressed as a separate element in the profile of an information literate law firm.

Recognition of the value and diversity of the various types of information that exist in a law firm is the first step for the organisation. Creating the infrastructure to capture and provide access to that information is the next. This process will almost invariably involve the use of information technology to provide systems and databases that make both ends of the process (capturing and accessing) part of everyday functionality. Beyond that, the organisation must create an environment where staff actively participate in the processes supported by the technical and organisational infrastructure. Organisations need to consciously create themselves as learning entities.

An information literate organisation does not simply find and store information, it also displays an element of sophistication in the ways it makes use of the information. Crucial to this is a learning culture. Information stockpiling is easily achieved, but more importantly, organisations that *learn* from the information they gather have an edge over competitors. To return to the university student analogy, most students can search for articles and store details of their research, but students who have the information literacy skills to analyse and synthesise that information, and then apply it to more varied situations, have a clear advantage.

To gain a competitive edge, organisations need members who make the most of technology, systems and organisational processes. An organisation achieves this by encouraging learning, innovation, and sharing knowledge. Browning, writing for the *Australian financial review* on knowledge management, says 'in traditionally managed companies, encouraging teaching instead of mere ideas stockpiling has been one of the greatest challenges to smarter working'.[3]

A learning company is 'an organisation that facilitates the learning of all its members and continually transforms itself'.[4] This description links the organisation's ability to learn back to the ability of its members to learn. Candy notes that in the real world of practice, the need for learning crops up in much more chaotic, urgent and diverse patterns.[5] For this reason, highly structured, trainer directed training does not always produce the necessary results in the real world. Learner directed training which is integrated with work activities has great potential for producing deeper understanding and encouraging life long learning. Of course, this kind of training often needs even more detailed planning on the part of the organisation. Candy makes the point that while the information society has evolved without planning, the learning society is still part of an unrealised dream and the reason for this is that a learning society needs to be planned.[6] The same can be said of learning organisations; the information economy has 'happened' to organisations without conscious planning, but a learning organisation (which can deal with information overload) needs effort and planning, and may still not exist.

Profitability

Giving quality legal advice does not mean that a law firm will be competitive and profitable. That depends on many other factors. *Not* giving quality legal advice, on the other hand, will generally mean that a law firm cannot be profitable in the long term, because its product cannot compete with that of other law firms. So in order to be profitable, the firm must be able to guarantee consistently high quality legal advice, *and* manage its business well.

To take the first element of profitability – guaranteed high quality legal advice – law firms gain leverage from smart use of existing knowledge and know how. They invest in infrastructure eg library catalogues and precedents systems, and personnel to ensure that not only are frequently used documents and research materials readily available for adaptation and application to current situations, but the effort and expertise that goes into highly specialised transactions becomes part of a corporate memory that is able to be used as leverage for other transactions. Expertise and innovation is expensive to generate and difficult to capture and transfer. Technology based systems cannot adequately deal with tacit knowledge or highly specialised know how, and consequently innovative people centred ways of transferring or expanding expertise are required. Law firms that are successful at sharing this kind of knowledge and using it in transactions greatly enhance their ability to provide consistently high quality legal services and can do it faster and cheaper than their competitors.

Much of the information gathered or produced by a firm can assist it to understand what either makes it profitable or impedes its profitability. This is the second element of profitability. Internally produced information can tell an organisation what types of transactions generate the most profit, where time was saved by reusing information, what the cost and value of support services are, which groups or departments are doing well, which are not, and often why. Organisations can also deliberately gather information about their clients and competitors, analyse industry trends, and make predictions about the future of their business. All of these activities are information dependent, and all require processes and structures which are set up to routinely capture and report on various aspects of the business.

An understanding of what factors contribute to or detract from profitability, based on information analysis, is an important element of information literacy for a law firm. Again, gathering the information is something that technology allows most firms to do comparatively easily. The human and managerial factors involved in analysing that information, taking non financial qualitative arguments into account,[7] and then taking action to improve performance, are what distinguish an information literate firm from other firms.

Learning and know how sharing culture

Up to this point we have discussed the firm's structures and processes for capturing information and maximising profitability. The third prerequisite for organisational information literacy concentrates on the organisation's people. Because it is made up of individuals, it is essential that the culture of the firm reflects its focus on knowledge, learning and know how.

Policies, procedures, organisational structure, technological capability and information capture can only be of benefit to a law firm when its staff use the structure as a platform for learning, contributing to the organisation's corporate memory, and delivering superior legal services. While a true knowledge company may not exist and may not be an attainable goal, great value lies in the pursuit of the goal.[8] Information literacy is about attitude and conceptualisation, as much as it is about discrete skills. When the organisation's focus on learning and know how sharing is truly embraced by all staff, one of the essential prerequisites for becoming and continuing to be an information literate organisation is fulfilled.

Broadbent describes knowledge management as enhancing the use of organisational knowledge through sound practices of information management and organisational learning.[9] An information literate law firm appreciates the value of both information management and organisational learning and strives to create and maintain a culture among staff that enables those processes to have real effect on the quality of its services.

Enabled staff

In order to give high quality legal advice, a law firm has to employ good lawyers who grow to be better lawyers in the environment created by the firm. Lawyers will become better lawyers if they have the resources to do a good job. It is difficult to become information literate if you work in an environment that is information poor. Lawyers need library services, quality precedents, coaching and mentoring from their peers and superiors, access to relevant training, and frequent, meaningful appraisals. They need to be rewarded, not just financially, for activities that contribute both to their own development as a professional, and to the firm's development as a learning organisation.

The resources and structures that exist to enable staff to do their jobs well must exist in more than name only. A set of *Commonwealth law reports* is not a library *service*. A database is not an effective precedent system unless its contents are valuable and *valued*. Policies that assign mentors or speak about coaching staff are of little use if coaching and mentoring is a process for 'when we are less busy', rather than an accepted part of everyday operations. Providing access to training means nothing if staff are subtly punished for wasting billable hours attending professional development activities. An organisation that truly enables its staff to do the best possible job enhances its ability to benefit from its human capital.

Information literate staff

When lawyers work in an adequately resourced environment where everything they need to do a superior job is at their fingertips, they then need to find pathways through the profusion of resources. This is where the information literacy of individuals comes into play.

An information literate lawyer, working in a law firm environment

- understands how information impacts on their job
- finds appropriate information
- analyses the information
- manipulates it for the purpose at hand
- synthesises the information to create know how
- stores it for future use by anyone in the firm in way that facilitates know how sharing
- reuses the information and shares the know how they or other staff have created.

This definition has its roots in the many definitions of information literate persons in the literature, but takes into account the context in which the individual, in this case a lawyer, is working. Many of the skills identified; finding, analysing, manipulating, synthesising, and reusing are the same skills that are identified repeatedly in other profiles. This profile differs in that it allows for an information literate staff member to contribute to the *organisation's* corporate knowledge, and for the concept of creation of information and development of know how that can be reused by a variety of people in the organisation.[10]

Conclusion

Information literacy is what enables an organisation to capitalise on its knowledge assets. Knowledge management has captured the imagination of managers across the world, and the literature about it is ever expanding. If knowledge management is an organisational theory that focuses on knowledge as the business' central asset, then information literacy is the practice that makes the theory work. Organisational learning is central to both concepts. Lepani places information literacy between information and knowledge, arguing that 'using information literacy, data and information are turned into knowledge, insight, foresight and wisdom'.[11] We can go further than that and say that organisational information literacy turns knowledge and know how into corporate assets.

Information literacy is certainly not the sole domain of librarians working in isolation from their organisations. Academic librarians have long recognised that information literacy programs must be incorporated into the real work of students. It is time for managers to recognise that in the information economy, information literacy is an essential, practical path to excellence in all facets of their businesses.

With the exponential growth in information, knowledge, and competition in the legal marketplace, information literacy is no longer the jargon of the lunch time seminar, nor is it a hazy but impractical goal. It is now an imperative.

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FROM TRAINERS TO EDUCATORS: LIBRARIANS AND THE CHALLENGE OF CHANGE

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Abstract *A key strategy for the development of lifelong learners is the integration of information literacy principles and skills into course curriculum. To enable such a strategy, librarians must develop their teaching expertise and foster educational partnerships with course designers and academics. It is essential that preservice courses and library staff development programs provide opportunities for the development of teaching skills, knowledge and abilities. This will enable shared understandings of teaching and learning outcomes between, and strengthen teaching partnerships with, academics and librarians, thereby facilitating the integration of information literacy into the curriculum. For the librarians, these programs can foster confidence in their own teaching abilities and add value to their personal contributions to the educational process. This approach to staff development also emphasises the educational role of the library in a teaching and learning environment. This paper examines the potential benefits of this philosophy for both the library teaching staff and information literacy in higher education and identifies the elements which may be addressed in a staff development program, such as curriculum design, learning outcomes, learning styles and evaluation. It will also highlight a range of options for staff development programs and discuss issues for future consideration.*

Academic librarians have long been engaged in the educational endeavours of their parent institutions. Universally accepted titles such as user education or bibliographic instruction, while now subsumed within the broader concept of information literacy, are testament to both an established role, and an evolving discipline, within the profession of librarianship.

For those librarians who follow this path, the rewards are many. Characteristically, they are dedicated individuals who strive to provide a challenging and rich learning experience for learners and who are enthusiastic, resourceful and creative in the pursuit of effective user education. With exposure to information literacy throughout the academic experiences of students as central to the development of lifelong learners, academic librarians look to foster and intensify educational partnerships with course designers and academics. The integration of information literacy knowledge, skills and understandings into the curricula stands as the ultimate objective.

To enable such a strategy, librarians must be, positioned as key educators in the teaching and learning environments of the future. However, while some may be intuitive teachers, many are unprepared theoretically, technically and practically for the role, and the experience can lead to frustration and prove detrimental to their self esteem, confidence and enthusiasm.[1, 2]

As teachers, librarians merit not only appropriate and timely recognition of, and support for, their specialised role, but also enriched education and training which services their unique requirements. This paper examines the potential benefits of this perspective for both the library teaching staff and information literacy in higher education. It also proposes an educational model for potential programs, highlights selected initiatives in practice in Australia and abroad and identifies issues for future consideration.

Convictions for change

Change frequently creates a state of conflict within organisations. At once it can be responsible for ingenious organisational initiatives and reprehensible personal stress. In the absence of due context, change is often seen by the individual or group as a threat to the widely perceived status quo and so can be difficult to justify. Lamentable as it may be to some, to achieve information literacy goals and objectives, change will be inevitable. The following discussion looks to place the imminent changes generated by the growth of information literacy in context.

Better teaching – better learning

The notion of teaching attracts assorted definitions. Ramsden[3] defines teaching in simple terms, as that which includes the 'aims of the curriculum, the methods for transmitting the knowledge those aims embody, the assessment of the students, and the evaluation of the effectiveness of the instruction'.

A more complex definition advanced by Boyer[4] describes teaching as a dynamic endeavour involving all the analogies, metaphors and images which serve to build bridges between the teacher's understanding and the student's learning. He emphasises that 'great teachers create a common ground of intellectual commitment. They stimulate active, not passive, learning and encourage students to be critical, creative thinkers with the capacity to go on learning' via the implementation of pedagogical procedures which are carefully planned and continuously examined. Teaching is not merely transmitting knowledge, but *transforming* and *extending* it as well.

Regardless of the context, the teaching librarian contributes to the learning process and the enhancement of learning outcomes for each student. Ad hoc instruction is a routine phenomenon for most reference librarians; however, formal teaching situations require greater emphasis upon reflective curriculum design and effective, appropriate delivery. While many librarians may have both education coursework and experience as teachers, frequently the librarian has little or no prior theoretical or practical training to inform their own practice and is, therefore, ill equipped to assume this complex role.

The Deering Report of 1997 recognised the importance of good teaching and the need for higher education staff to acquire formal teaching qualifications. As stressed by McNamara and Core[5] also stressed that if 'librarians are to play their full part in the provision of a quality learning environment for students, then librarians must become trained and qualified educationists (sic) as much as their academic colleagues'. Teaching knowledge and skills must take an essential, rather than desirable, place in the librarian's portfolio.[6]

Faculty/library collaboration

Loomis contends that information literacy, as a goal, has transformed not only *what* librarians teach but also *how* they teach. She further states that 'the influence of this paradigm… also provides… instruction librarians with a powerful tool for building new coalitions and redefining old ones'.[7] If the ultimate goal is the integration of information literacy into the curriculum, then the key strategy must surely be the fostering of broader, flexible educational partnerships within tertiary institutions. As Loomis stresses, such coalitions are critical if educational institutions are to succeed in empowering students with the knowledge and skills they will need to survive and thrive in an information world.

However, emphasis on the educational role of the librarian demands educational credibility with academic staff. Librarians must not only be able to demonstrate sound pedagogical knowledge, they must also be able to communicate effectively with faculty colleagues using mutually understood terminology. McNamara and Core[8] indicate that if librarians are to be equipped to work in effective partnerships with academic colleagues, it is not sufficient for them to receive minimal, or no, training in educational methods and learning strategies. They must be provided with the tools and language to succeed.

Educational role in the university

Curriculum development should no longer remain the total responsibility of the academic. As previously noted, librarians must be partners in curriculum development, course planning and delivery, thereby assisting academics to 'help students develop into effective consumers of information'.[9] This shift in responsibility provides opportunities to advance faculty and institutional goals while concurrently raising the professional profile of the librarian within the educational environment.

The metamorphosis of pedagogical boundaries will be difficult for many librarians as well as academics. Alan Bundy[10] recognises that librarians in universities are often still equivocal about asserting their integral educational role. With librarians uniquely positioned to become partners with faculty in curriculum reform, they need to re evaluate their role in higher education and work towards becoming leaders and innovators in their interaction with faculty.[11] The higher education community, in turn, must seek to foster a professional culture which recognises that professional roles within the institution are fluid.

Professional development

Barrett and Trahn[12] observe that, while professional staff numbers have declined in Australian university libraries, the median ages of librarians and their workloads have increased. They further note that resources for library staff development have often been the first casualties in library budget cuts. Regardless of financial and labour constraints, employers have a continuing responsibility to provide opportunities for the professional development of their employees. While a diverse range of developmental opportunities is available to professional staff, recognition of the need to provide an education program for teaching librarians is limited.

A survey, conducted in 1986 by the Wisconsin Association of Academic Librarians into the educational background and characteristics of bibliographic instruction librarians in Wisconsin, found that 62 per cent of the 180 respondents had been, or were still, actively involved in bibliographic instruction. Sixty per cent of the librarians indicated that some knowledge of learning theory and teaching methodology was most often received as a component of a formal program *other* than their degree in library science. The study further indicated that 83 per cent of respondents cited self study as one means by which they learned about or prepared for bibliographic instruction, followed by workshops and conferences.[13]

As the report of the survey rightly notes, specific articles on vital subjects of learning theory and teaching methodologies do not make an appearance in the professional literature of librarianship. Conferences and seminars, while useful forums for peer networking and information dissemination, are ineffectual training opportunities. Likewise, few graduate courses provide the requisite basics and many librarians enter the workforce unprepared for their teaching role.

Yet it is the reference librarians who constitute the primary teaching force of academic libraries and on whom the achievement of information literacy goals depends. Libraries must look to provide a variety of developmental experiences for individuals and teams engaged in teaching.

Education for teaching: a model

The full scope of a program or course designed to suit the particular needs of academic librarians is open to debate. However, there are key elements which are fundamental to the success of the majority of teaching and learning interactions; teaching librarians require an understanding of these concepts of general education and how each might relate to information literacy. These are succinctly identified by Kirk[14] as:

- knowledge of educational theory and its practical application through instruction design, including knowledge of theories of learning and human development
- ability to write instructional goals and objectives
- ability to develop instructional programs and materials appropriate to the instruction goals and consistent with a personal theory of learning and human development
- ability to formulate and execute an evaluation of instructional sessions and programs.

Learning theory

If, as has often been assumed, teaching or instruction is an application of theories and principles of learning, then the state of teaching depends directly upon the state of one's knowledge of learning and learning theory.[15] While there is no agreement on what constitutes learning or on how it occurs, there cannot be agreement on one theory of learning or teaching. New methods and theories arise to replace old ones.

However, there are core principles upon which the integration of information literacy into the academic environment depends. Librarians require a basic understanding of the progress of cognitive growth; they also need to embrace a critical thinking paradigm, of which information literacy is a subset, and recognise diversity in learning styles. The latter is particularly essential in an environment which is comprised largely of adult learners. However, as Barrett and Trahn[16] recognise, understanding the nature of adult learners is only one side of the pedagogical experience, 'understanding what comprises good teaching practice is the other'.

Awareness and adaptability are critical to the selection of suitable learning theories and their application to learning experiences and teaching practice. If teaching librarians are acquainted with a range of learning theories, they may boast an improved understanding of why some practices prove better than others. They will also allow for the selection of learning theories to be guided by the educational and social context in which they operate.

Curriculum design

'The aim of teaching is simple: it is to make student learning possible'[17] via the use of good teaching which encourages high quality student learning. At the heart of good teaching lies a course or curriculum which provides intellectual challenge, appropriate content and stimulating learning experiences.

In terms of information literacy, this approach involves the integration of the principles of information identification, use and evaluation into existing curricula, or adaptation of these principles into new programs. Information technology will continue to constitute a large component of the information literacy curriculum; librarians must adapt and contextualise the use of a wide range of technologies in terms of communication and information retrieval.

In addition to serving standard face to face delivery, curriculum design of the future will need to accommodate evolving trends in higher education. Moves to introduce improved mechanisms for course provision, such as online teaching and flexible delivery, are recent examples which demand innovative approaches by academics and librarians to unit and course design. Finally, good curriculum design is reflected in effective learning outcomes which are measured via flexible, ongoing assessment.

Library management needs to foster a culture of innovation which allows for teaching staff to take creative approaches to course design, and makes provision for appropriate resources and adequate preparation time.

Delivery

Presenting to a group can be a challenging and, at times, threatening experience for the unprepared. McAulay[18] notes that one is 'fairly sure about what you think they need to know, but at a loss to know how to teach them… it is a matter of how [one] actually imparts information, and how students learn'.

Sound preparation and confidence is critical to performance, and highly developed communication skills are critical for success. The push towards active learning, as opposed to passive education, and an emphasis on problem based learning for critical thinking will position teachers as facilitators of learning rather than deliverers of information; learners will assume greater responsibility for their learning.

Teaching strategies must reflect such changes. Librarians require expert guidance on an ongoing basis to ensure that they remain conversant with current trends in practice. They also require regular professional opportunities to improve and develop their delivery strategies.

Assessment and evaluation

Assessment of student performance, whether formal or informal, is the requisite indicator of learning in higher education. It is important that the teacher has the ability and knowledge to adequately and comprehensively examine students on course content, to measure and analyse test results, and to evaluate justly students' educational development and progress.[19] As the librarian, in many cases, does not have long term responsibility for a core group of students, assessment falls primarily to the academic concerned. However, as the push continues to integrate information literacy into the curriculum, it becomes essential for the librarian to be familiar with, and be able to develop, appropriate methods of assessment.

Critical to the success of the learning process is the evaluation of program content and delivery. Ongoing review of content ensures currency and fosters originality. Regular critiquing of teaching performance, either by peer review or student evaluation, encourages innovation and self improvement. Although many such processes are established and supported within academia, they are implemented to a limited extent in information literacy programs.

Professional development strategies: a review of practice

Whilst extensive attention is given globally to the broader issue of library staff development, it is fair to comment that little attention is being devoted to the specific issue of educational skills development for library teaching staff. The following section highlights a selection of notable programs which have been either specifically designed to suit the needs of information professionals, or which may be adapted to satisfy their requirements.

EduLib

In February 1995, the University of Hull in association and the University of Abertay Dundee, with a contribution from the Staff and Educational Development Association (SEDA), submitted a proposal entitled

Educational development for higher education library staff. From this was born *EduLib*, a Joint Information Systems Committee (JISC) funded project under the *eLib* program. Its aim was to enhance educational expertise and teaching skills in the higher education library and information services community.[20] The project was funded from 1995 to 1999.

During the past three years the *EduLib* project has provided courses in teaching and learning for higher education librarians and information services staff in the United Kingdom. In total, approximately 250 delegates (representing two thirds of the UK higher education institutions) attended *EduLib* courses. The courses were based on a set of teaching materials which were developed and field tested so that they might be used by library and information services staff, with some educational expertise, to provide courses for colleagues.[21]

The comprehensive set of workshop materials, *Teaching for learning in libraries and information services: a series of educational development workshops*, provides the basis for nine key workshops on the following themes: understanding learning; the nature of teaching; planning a teaching and learning event; observing teaching; teaching methods; reviewing learning and assessment; diversity, individual differences and equality; information technology in learning and teaching; open and distance learning.

More detailed project and program information can be found at the *EduLib* website at http://www.tay.ac.uk/edulib/index.html.

QUT Library: EduLib

QUT Library, in 1998, instigated a major review of its information literacy program. Conducted by an external consultant, the fundamental thrust of the information literacy review was an emphasis upon a strategic approach for the Library relating to a broader information literacy agenda for the University.

The review tabled a number of key recommendations which impact significantly upon the educational knowledge and skills of library teaching staff. These can be summarised in terms of the need to

- promulgate throughout the University models for evaluating information literacy initiatives in terms of students' learning outcomes, curriculum structure and assessment
- identify stakeholders responsible for fostering information literacy and develop collaborative partnerships to facilitate information literacy curriculum development and teaching strategies
- place a strong emphasis upon involvement with training, staff development and mentoring, both within the Library and for the QUT community
- ensure Library staff are positioned as advocates of information literacy within the University. In response to the review's emphasis on the Library's educational role, QUT Library has undertaken to implement a staff development program which will support future objectives.

However, rather than develop such a program in house, the Library sought to identify an existing product or course which could be tailored to suit their requirements. After much research, the *EduLib* program was selected as a program which would best adapt to the needs of QUT library staff and its implementation has been included as part of the Library's Strategic Plan 2000-2001. Coincidentally, the undertaking complements current Library goals and initiatives pertaining to flexible delivery and online teaching.

The Library's staff development course is currently in the preparatory stages with the proposed implementation signalled to commence in early 2000. An external, SEDA accredited educational facilitator will undertake delivery and development and trainers and the services of additional teachers will be enlisted for selected components of the course. On completion of the initial course, the Library will examine strategies for implementing the program on a regular basis to cater to the continuing needs of library staff.

UNSW Library: TSISL

In 1996, a group of information skills librarians from University of New South Wales (UNSW) Library undertook a five day equivalent train the trainer course adapted specifically to their needs. From this beginning, the Library undertook the development of a prototype staff development program for enhancing the teaching skills of information skills librarians, delivered principally using the web and with an emphasis on teaching in a digital environment.

Its development is based on a recognition that, in practice, unless librarians are given appropriate training it is easy to ignore effective teaching practice in their jobs, and that most librarians have received little formal training in pedagogical techniques.[22] The program is presented in a web based flexible learning mode, specifically designed to cater to 'professional staff with heavy workloads and rigid rostering requirements, and/or those who cannot access established staff development programs because of isolation or distance, to participate in extended staff development'.[23]

The program states its objectives as
- to enhance the abilities of experienced information skills librarians to design and deliver effective information skills programs
- to ensure librarians are aware of and can incorporate best practice pedagogical concepts as well as technical competency into information skills programs development and delivery
- to ensure that those librarians working with academic staff can participate professionally on equal terms.

Barrett and Trahn, in a paper presented at the RAISS Conference 1999, comprehensively detail the TSISL program.[24] Further information can also be found at the UNSW *Library's teaching skills for information skills librarians* website at [http://www.library.unsw.edu.au/~sshl/teach/hello.htm].[25]

Continuing professional education

Many tertiary institutions provide programs or courses which address the continuing professional development needs of their academic staff. These opportunities exist in a myriad of forms, from regularly scheduled workshops or seminar programs to accredited formal graduate certificate courses. Expectations of participation also vary from voluntary through to obligatory when, for instance, course completion may be tied to performance review and tenure.

However, the content of such courses is specifically designed to address the needs of faculty teaching staff and, whilst there may be much of value for the academic librarian, constraints on participation exist. More often than not, the content, objectives and delivery do not best suit the in service and continuing education needs of teaching librarians. Barrett and Trahn[26] recognise that 'the sad reality is that the commitment in terms of time and of cost to the individual librarian for a formal academic program is such that these worthy programs are not within the reach of more than the very rare, enthusiastic and unusually time rich individual. Library staff need something more concise, and oriented to practical application'.

The existence of these programs does, nevertheless, open up opportunities for modification and redevelopment. In collaboration with those individuals or groups responsible for the development of such courses, programs could be tailored to meet the different and specific needs of library staff.

Examples of such programs include

ED61: Graduate Certificate in Higher Education (QUT) [http://www.olt.qut.edu.au/edu/ED61/]

Graduate Certificate in Higher Education (Monash University) [http://www.adm.monash.edu.au/ched/courses/GCHE/]

GIH351: Graduate Certificate in Higher Education (Griffith University) [http://www.ua.gu.edu.au/hbk/GIH351_01.htm]

Institute for Information Literacy 'Immersion' program

The Association of College and Research Libraries (ACRL), a division of the American Library Association (ALA), administers the *Institute for Information Literacy* (IIL). This Institute regularly conducts a program which aims to equip instruction librarians with the intellectual tools and practical techniques necessary help institutions build or enhance their instruction programs. Conducted over four and a half days of intensive training and education for instruction librarians, the course curriculum focuses on six fundamental areas: information literacy, leadership (working within the academic environment), learning theory, teaching (making the connection between theory and practice), assessment and program management.

Immersion 2000 will be conducted 4–9 August 2000 at the University of Washington. Applications close 15 December 1999 and further information can be found on its web page [http://www.ala.org/acrl/nili/nilihp.html].

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The future: issues for consideration

This paper contends that the majority of librarians in academic institutions will, at some stage in their career, be responsible for the teaching and learning of students. On this basis, the following issues arise for discussion.

Nature of the training

Kirk[27] observes that there is no adequate term to encompass the conceptual framework within which librarians teach, and notes that the historically accepted terms user education and bibliographic instruction seem too narrow in their scope. Yet the current term information literacy, either as a concept or a classification, arouses such diverse understandings that collaborative strategies and partnerships within the library profession and beyond are often hampered. It is critical that all parties involved in teaching and learning come to a mutual agreement on the definition and scope of information literacy and recognise the evolving roles and responsibilities it entails.

The responsibilities of teaching librarians in the academic environment, as recognised by Patterson and Howell[28] are vast and complex, and not defined by the academic parameters typical in higher education. The individual must be able to blend the knowledge and skills possessed by both librarian and teacher and implement and integrate a range of diverse programs in an highly structured environment. Recognition from across the academic community of these responsibilities will be critical to the future success of information literacy. Allowance must also be made for sufficient time for librarians to prepare curriculum and program evaluation.

Information literacy programs have 'unique characteristics [aside from content] which set them apart from mainstream learning activities for many students. Information skills sessions still tend not to be as integrated with required studies as conventional teaching programs, and are more frequently an ad hoc, one off activity, or an activity with few contact points built in to the program'.[29] As librarians do not generally have ownership of a group or class of students, and are frequently required to deliver classes at the discretion of the academic, the timing and scope of contact is not always to the advantage of the students. Educational collaboration between faculty and librarians will address these shortfalls.

Professional education for librarianship

The question of 'who trains the trainers?' remains open to much debate and popular opinion falls into two distinct schools of thought. The first contends that the professional readiness of the librarian should be addressed within the graduate course or librarianship degree, while the second point of view argues that it is the responsibility of the profession in the form of ongoing professional development. However, current practice reflects much less of the first position than of the second.

Kirk[30] believes categorically that it is the role of education for librarianship to prepare professionals for teaching roles as academic librarians. In the main, librarianship courses worldwide incorporate into their curriculum the requisite information and management theory and the technical and technological skills required by commencing librarians. However, there are limited instances where such courses address the teaching skills many librarians require in their roles. Patterson and Howell[31] also observe that skills such as preparing class materials, lecturing, evaluating, and numerous others are simply not being taught in library schools or in continuing education courses.

The second school of thought is based on a core philosophy that the purpose of education for librarianship is not preparation for the first job but preparation for a career, and that students are often uncertain about the future direction of their careers.[32] [33] While this is certainly a fair observation, it fails to acknowledge the duty of care inherent in their educational mission. Other professional education courses, such as those designed for the legal and medical professions, ensure that the knowledge and skills fundamental to effective practice in a chosen profession are addressed in the course curricula.

In 1987, it was estimated that 75 per cent of the academic reference positions advertised in the professional literature required skills of both the traditional reference librarian as well as the classroom teacher. It would appear, however, that there is a fundamental unwillingness by library schools to recognise the importance of the teaching role,[34] or a misconception on the part of course designers as to the degree to which librarians participate in teaching and learning. If library schools are to remain relevant, they must continue to change from technically oriented trade schools to education in a broad sense and to provide the education and experience necessary for the commencing librarian to effectively and confidently perform as an educational practitioner.[35, 36]

Other training options

If not provided preservice, there are a variety of in service options available to the practitioner, ranging from self motivated personal development to that provided at an institutional level.

The majority of teaching librarians hone their craft *in situ* via independent study, professional reading and discourse with peers. The development and support of professional networks and teaching teams allows forums for the exchange of ideas, development of strategies and techniques and the discussion of issues of concern. It also can provide opportunities for peer group observation and feedback on teaching style and effectiveness. Access via the Internet to pertinent discussion lists and websites assist in this regard.

Various university libraries have undertaken formal in service programs developed in house by individuals or teams responsible for information literacy, such as TSISL at UNSW, while other libraries have developed less ambitious in service workshops and one off training programs.[37] Others, such as QUT Library, have adapted existing programs to suit the particular needs of their staff. McAulay[38] also identifies a purpose designed course, conducted by either a library school or professional organisation, as an ideal solution.

Finally, as previously mentioned, professional programs designed for academic staff within universities have always included aspects which were of benefit to information skills librarians in developing their own teaching skills.[39] Alternatively, one could seek to obtain a postgraduate teaching diploma or adult education teaching certificate, or participate in induction courses for new lecturers. Although such courses often require organisational support in terms of time and cost, many libraries recognise the benefits to all concerned.

Support and maintenance

Patterson and Howell[40] report that, within the ranks of teaching librarians, 'feelings of detachment and isolation and the absence of sufficient constructive feedback, coupled with a lack of appropriate recognition for time and effort, seem common'. Therefore it becomes critical to the health and performance of their staff that employers recognise that academic librarians need enhanced and extended support to conduct their unique and necessary function as educators. Heery and Morgan[41] indicate that this may include peer, administrative, technical and clerical assistance, as well as management support for training and staff development to enhance or update teaching skills.

Effective teaching demands sufficient time for adequate preparation and, with regard to the unique position of librarians, collaboration with faculty staff. Clearly, however, it will become increasingly difficult for reference librarians to balance all those duties for which they are responsible. As more time is devoted to the educational role of the library within higher education, libraries will need to absorb, reassign or eliminate incidental duties with the view, ultimately, to redefine the role of the reference librarian. To reflect this shift the reward structures of the profession and the tertiary sector may need to change.

In addition to the provision of adequate time for practical application, academic libraries must provide ample institutional support, in terms of time and staff, to allow their librarians to develop professionally.[42] McNamara and Core[43] who suggest that 'there must also be an institutional approach which ensures that the development of librarians as educators and managers of learning is integrated within institutional policy' extend this argument.

Support can also emerge from beyond the organisation. As the information literacy push gains momentum, so arises a number of related associations and committees, of which the missions and goals reflect the needs of the library educator. In Australia, one such group answers this call. The Information Literacy Special Interest Group of ALIA [INFOLIT] states its aim to be a focus for librarians to make a contribution to national information literacy advocacy and, by doing so, enables and promotes networks of support for librarians. It provides a newsletter, website and e-list for members. More information can be found at http://www.alia.org.au/sigs/infolit/.

Conclusion

Three actions – *training*, *support* and *recognition* – combined with three qualifiers – *timely*, *effective* and *adequate* – are the tickets to the success of information literacy in higher education. The teaching librarian, however, is the key.

According to Oberman[44] although the 'world of information may be becoming more complicated, the cognitive skills necessary to successfully operate within it remain the same'. She adds that the teaching methods that instruction librarians use to prepare students to face the contemporary world of information need to change. As a teacher, the librarian must be able to speak and communicate effectively and to impart information to students in a stimulating and competent manner.[45] Ideally, they should be able to base their curriculum design judgements and delivery strategies upon sound pedagogical understanding and knowledge.

Yet the majority of librarians entering the workforce do so with minimal theory or instruction in the area. As Kirk[46] observes, 'library school graduates should expect to do a good deal of learning on the job in their first few years as a bibliographic instruction librarian' as they rarely receive pre service training. The development of their teaching skills is often self motivated or, if conducted at an organisational level, irregular. This want of theory and practice can manifest as underdeveloped or inappropriate skills and pose a significant barrier for information literacy.

Libraries, library schools and professional associations must combine to address the needs of the librarians who teach in academic institutions. Librarianship course curriculum should be modified to include pedagogical foundations of education and guidance on delivery techniques. Ultimately, the educational role of the librarian must be acknowledged and the teaching of teaching given a priority.

For the information literacy goals and objectives of academic libraries to be achieved, it is crucial that both the practitioners and programs are well supported. They require appropriate time in their weekly schedules to prepare content, design assessment and teaching strategies, and conduct evaluation of the programs they deliver. They also require adequate resourcing in terms of teaching materials, support staff and additional funding when necessary.

Recognition of the changing status of the librarian, in the form of accreditation, performance appraisal, promotion or organisational rewards, needs also to be taken into consideration. However, as Ramsden[47] points out, 'improvements in the reward system depend not so much on handing out prizes and penalties, but on a change of attitude towards recognition of the professional teachers' role in higher education and an understanding that teaching can be a challenging and satisfying activity'.

It stands as testament to the dedication, energy and enthusiasm of reference librarians in higher education that the majority continue to derive great enjoyment and satisfaction from the teaching aspects of their positions, despite the previously mentioned difficulties. However, the continuation of all or any of the situations mentioned in this paper threatens to eventually, as Patterson and Howell[48] indicate, 'deplete energy, enthusiasm, and finally, the loss of a once effective advocate of the cause' for information literacy. Professional and personal burnout is the potential consequence.

The final word must rest with Kieft[49] when he states that 'if the librarian is an educator, then the librarian's task is to cultivate students, not simply provide them with information, and librarians, together with the institutions in which they work, must find ways to enable librarians not simply to make information more accessible but to engage the minds and lives using it'. Surely such a philosophy is the ultimate aim of education.

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AIMS	OUTCOMES	STRATEGIES	RESOURCES
To highlight the professional development and training opportunities essential for a commencing librarian	By reviewing a case study (provided on the day), participants will identify a number of strategies which would have prevented the encountered problems	Participants divide into three groups Each group is assigned a task to complete Each group presents results at the close of the session	Case study (provided) Overhead projector OHT pens Powerpoint 97 and associated PC and projector equipment
To identify strategies which foster and promote recognition of library teaching staff	Participants will prepare a list of strategies which can be executed in an academic library AND/or across the university		
To establish the support required by librarians to conduct effective information literacy programs	Participants will compose a list of recommendations which emphasise a number of critical support issues		

INTEGRATION OF INFORMATION SKILLS INTO THE SCHOOL CURRICULUM AT TRINITY LUTHERAN COLLEGE

Sharon Rushton
Trinity Lutheran College

Abstract *In a society of change a student must learn to think rationally and creatively, solve problems, manage and retrieve information and communicate effectively. By moving through different stages of skill development as years of schooling progress the student becomes more positive about resource based research and learns to think progressively from general to specific to focused. Confidence increases from initiation through to closure. By tertiary level of schooling the student is ready to independently apply skills learned in Grades 1-12 to any situation or problem solving experience whether it be in university or the work force. It is the responsibility of the whole school community to ensure that information skills are a part of the school curriculum. Partnerships that develop between teachers and learners ensure that skill learning takes place but only if the responsibility of the learning is shared by both. When this partnership expands and is shared by the whole school community the rate and quality of learning increases greatly. Students become more independent as they progress through stages of skill development as they see the importance of it. They more easily move into an information rich environment and a world of lifelong learning.*

The ever changing society in which we live today expects us to adapt and accept without reservations the alterations it makes to our everyday lives. Whether we like it or not, technology is here to stay and we are driven by that very technology to stay ahead of the increasing amount of information that bombards us.

Information literacy: the fuel for learning

We are experiencing an age of technology and information expansion. Our schools have been changing to keep up with this expansion and the changing needs of our students. No longer is it necessary for students to learn a multitude of facts. It is more important to know how to access those facts and where to find them. Students who learn to access information quickly and with ease are able to

- add to their reservoir of knowledge
- use a variety of information sources and technology
- process information they find and manage it sensibly
- show confidence in their ability to use information effectively
- become lifelong learners

Resource based learning and information skill development

Resource based learning has become the accepted method for developing information literacy in schools across Australia. This is not always easily accomplished but it can be done through an integration of information skill development into all areas of the school curriculum. Resource based learning assumes that students will learn from their own use of learning resources and activities connected with them.

The concept of resource based learning was implemented into many primary schools in the early 1990s. Because curriculum units at the primary level are often theme based, the use of a collection of resources within the classroom was an easy way of encouraging students to adopt a responsible role in their own learning, thus making it easy for resource based learning to become an acceptable method of learning within the classroom. Implementing resource based learning at the secondary level met with some resistance from older teachers more comfortable with lecturing their students and assessing content. However, resource based learning is now an established form of learning throughout all grade levels and most curriculum areas.

The school library resource centre has an integral responsibility in assisting students in their development of information accessing skills. These skills are used in selecting, interpreting and using information. They incorporate study, research and communication skills and they enable the students to become independent learners capable of accessing and processing information at the same time that they apply the skills of critical thinking.

These skills are not taught in isolation, but are integrated into relevant resource based learning situations across the curriculum so that through meaningful practice and application, mastery is accomplished and transference of skills takes place. Many skills are developed concurrently and are in keeping with the developmental stages of children and their particular learning characteristics and possible disabilities.

It is expected that particular skills will be introduced at a suggested year level and that all students at that level will be exposed to them. The degree of skill development will of course vary from individual to individual.

Information skill development at Trinity Lutheran College

In Queensland the nineties have seen a shift in education to establishing individual school development plans personalized for each school. The emphasis has been on quality schools and quality teaching and learning. There has also been a shift toward department or curriculum policy development. This has included the development of the role of the teacher librarian and policy regarding information literacy including an overview of where the school is headed for its students and the future.

At Trinity Lutheran College the students and their needs have been the primary focus and policy has been developed around them. The school's philosophy of education centres around its students who are encouraged to continually develop their God given talents in spiritual, intellectual, physical, cultural, emotional, and social spheres. In keeping with the College's ethos to foster an atmosphere in which learning is prized, excellence sought and valued, and honest effort recognised and esteemed, regardless of the degree of success, the Library Resource Centre has endorsed a policy of information literacy.

The aim of the Library Resource Centre has been to create a service that is the learning and teaching centre of the school. It embraces resource based learning and believes that this type of learning allows teachers to be facilitators in the process of learning, not the sole sources of information. Just as important as what a student knows, is the process of knowing where to find that knowledge and how to use it. By developing learning and thinking skills students learn how to learn and develop the skills which enable them to become independent, responsible lifelong learners who are able to apply, transfer and use the skills acquired in a variety of situations.

The teacher librarians at Trinity Lutheran College and Trinity Lutheran Primary with their specialist knowledge of the information process have key roles to play in the development of information skills. Their knowledge and understanding of the information process, combined with their knowledge of resources and the technology to enhance access to information resources of all kinds, allows them to make a unique contribution to student learning. Their principal role is to assist students to become information literate by developing and facilitating learning and teaching strategies which will enable this to occur in all areas of the curriculum and all grade levels of schooling.

Integration of information skills into the whole school curriculum

As a teacher librarian becomes more involved in identifying and developing information skills it becomes apparent that information and research skills, like communication skills and study skills, are a part of the foundations of curriculum and that the whole school should be involved in taking on the responsibility of skills' implementation.

As Coordinator of Library Services and Teacher Librarian at Trinity it has been my duty over the past two years to approach school staff and convince them of the need to identify, select, implement and assess these skills as part of a whole school program. To accomplish this, I established an information literacy policy within the total school community. This involved the creation of a skills continuum or set of skills for lifelong learning. The list of 49 Common Curriculum Elements produced by the Board of Senior Secondary Studies of Queensland to prepare senior students for their end of school assessment was incorporated into the information skills continuum and these skills were agreed upon by all teaching, administrative and support staff members who are now implementing and reinforcing the skills from grade eight.

There is just as great a need to integrate information skills at the primary level and Trinity has been working closely with its sister school, Trinity Lutheran Primary. The primary teacher librarian and I have written and established an information literacy policy for both schools for grades 1-12. The primary teacher librarian is now establishing this policy at the primary level and integrating her part of the skills continuum into primary curriculum.

Trinity's information literacy policy complements and enhances each of the curriculum areas and departments at Trinity and supports the national Curriculum Profiles and Queensland's proposed curriculum changes with their eight key learning areas. These areas reflect the presence of information processing skills in specific strands within the profiles. All key learning areas require students to develop skills for analysing, interpreting, synthesising, organising and communicating information through reading, writing, speaking and listening. The key learning areas are

The Arts
English
Mathematics
Science
Health and Physical Education
Languages Other Than English
Technology
Studies of Society and Environment

Creating an information literacy policy across curriculum and across all grade levels of both primary and secondary schools has made the transition for grade seven students to grade eight much less stressful. Even something as simple as adopting one format for bibliography and referencing has made citation of resources much easier from grade five on. Integrating the information skills into curriculum has also been extremely valuable as exit results for year twelve students has shown and will continue to show for Trinity. The integration of information skills into curriculum is recommended if only for the value that it provides uniformity of learning throughout the school, a foundation upon which students can build and expand their talents.

It is also important to note that assessment criteria of any skills should remain uniform from grade to grade. It is only the level of difficulty that will change. Students will gain more understanding and proficiency with continued use of these skills from year to year.

The following guidelines are suggested for integration of information skills at any grade level in any school

- each skill should be functional and taught in the context of a curriculum topic of study
- each learner must be motivated to learn each skill and understand its meaning and its purpose
- each learner needs to be carefully supervised for development of correct habits in first time application of skills
- each learner needs repeated opportunities to practice skills with immediate evaluation of those skills
- each learner needs a varying degree of individual help when each skill is being introduced
- each skill should be taught at an increasing level of difficulty, moving from the simple to the more complex. As the skill gains in complexity it needs to build upon what has been learned before
- each skill should be taught in a variety of situations for maximum transfer of learning
- each program of instruction for skill development should be flexible for different rates of learning
- students should have access to a wide range of resources, facilities and equipment.

For Trinity the implementation of skills into the curriculum was not easy until assessment in each key learning area showed improved performance. The steps towards success were small at first. Establishing uniformity in bibliographic style from grade eight onward was our beginning. Once the teachers became accustomed to requiring that form of bibliography for every research assignment and included the bibliography in their assessment, the students became more relaxed and accepting of a bibliography as part of their assignments. It was easier then to move on to referencing and footnoting, note making, planning and evaluating. Now our students are well aware of the expectations of their teachers regarding research and information skills. Each of these expectations is set in writing and will soon be included in their student handbooks.

Summary

In a society of change a student must learn to think rationally and creatively, solve problems, manage and retrieve information and communicate effectively. By moving through different stages of skill development as years of schooling progress the student becomes more positive about resource based research and learns to think progressively from general to specific to focused. Confidence increases from initiation through to closure. By tertiary level of schooling the student is ready to independently apply skills learned in grades 1-12 to any situation or problem solving experience whether it be in university or the work force.

It is the responsibility of the whole school community to ensure that information skills are a part of the school curriculum. Partnerships that develop between teachers and learners ensure that skill learning takes place but only if the responsibility of the learning is shared by both. When this partnership expands and is shared by the whole school community the rate and quality of learning increases greatly. Students become more independent as they progress through stages of skill development as they see the importance of it. They more easily move into an information rich environment and a world of lifelong learning.

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Cooper, Janice Learning how to learn: implementing a school wide program *Access* 1(2) November 1987 p17-19
Common curriculum elements, descriptors and notes Brisbane, Board of Senior Secondary School Studies 1993
Haycock, Carol-Ann Resource based learning: a shift in the roles of teacher, learner *NASSP bulletin* 75(535) May 1991 p15-22
Learning for the future Carlton Vic, Curriculum Corporation 1993
Resources in learning, a focus on school development Brisbane, Department of Education Learning Resources Unit 1992
Rushton, Sharon and Kloeden, Elizabeth *Information literacy policy Grades 1-12 Trinity Lutheran Primary and Trinity Lutheran College* Gold Coast, Rushton/Kloeden 1998
Skills for information literacy Adelaide, Education Department of South Australia 1991
Teaching information skills Carlton Vic, Curriculum Corporation, 1997
The information literate school community: best practice Wagga Wagga, NSW, Charles Sturt University Centre for Information Studies 1999

Workshop outline

OVERVIEW
Explanation of information literacy skills as they relate to the goal of developing information literate students as described in the ALA definition of information literacy.

INFORMATION LITERACY SKILLS POLICIES
Explanation of why each school needs its own skills policy to fit in with the school's plan and ethos. This will include a display of resources for developing policy and will show a variety of styles.

THE CURRICULUM COMMITTEE
Discussion of a school's curriculum committee and the role of the teacher librarian as part of that committee. Included will be suggestions for being more assertive in establishing that role.

INTEGRATION OF INFORMATION LITERACY SKILLS INTO THE SCHOOL CURRICULUM
Details of how to work with department heads and classroom teachers to ensure that information literacy skills become an ongoing part of each curriculum or key learning area. Included will be a range of handouts for suggested use with these teachers.

CONCLUSION
Will include guidelines for integrating skills into the curriculum.

INFORMATION LITERACY COMPETENCY STANDARDS WORKSHOP

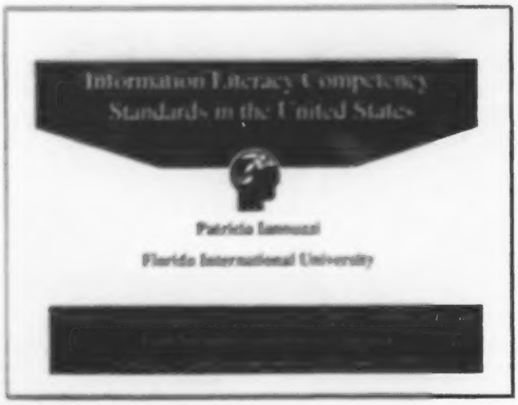
Patricia Iannuzzi
Florida International University Library

The workshop was facilitated by Patricia Iannuzzi as chair of a Task Force on Information Literacy Competency Standards for Higher Education, with representatives from various higher education associations and as co chair of the Association of College and Research Libraries/American Association of School Libraries (ACRL/AASL) Joint Task Force on the Educational Role of Libraries.

The workshop focused on both the ALA Information Literacy competency standards for higher education and the ALA Information Literacy competency standards for schools.

The Task Force Chair presented the standards and facilitated small group activities in reviewing the standards, performance indicators, and outcomes. (Patricia's presentation follows this brief introduction). Participants then critiqued the standards and explored appropriate assessment strategies. They also addressed the relationship between library instruction and information literacy, and discuss strategies for implementation. Input will be shared with the ACRL Task Force members and reflected in subsequent drafts of the standards.

The Information Literacy standards are also being shared with other stakeholders in the higher education community, such as the American Association of Higher Education, the Teaching and Learning with Technology (TLT) Group, and regional accrediting associations for United States colleges and universities. This was an opportunity to create a shared vision for information literacy outcomes amongst various education associations and between librarians in the United States and in Australia.

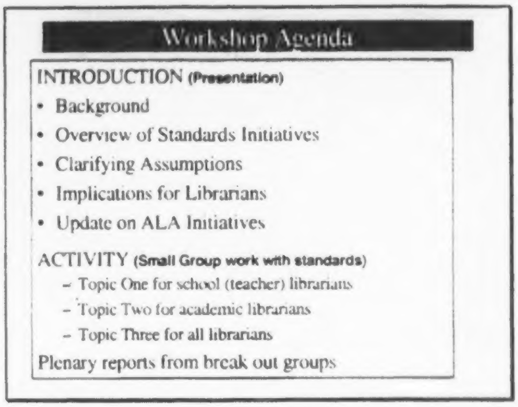


Information Literacy Competency Standards in the United States

Patricia Iannuzzi

Florida International University

Slide 1



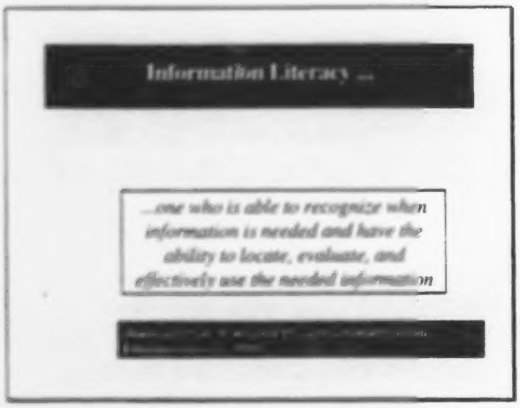
Workshop Agenda

INTRODUCTION **(Presentation)**
- Background
- Overview of Standards Initiatives
- Clarifying Assumptions
- Implications for Librarians
- Update on ALA Initiatives

ACTIVITY **(Small Group work with standards)**
- Topic One for school (teacher) librarians
- Topic Two for academic librarians
- Topic Three for all librarians

Plenary reports from break out groups

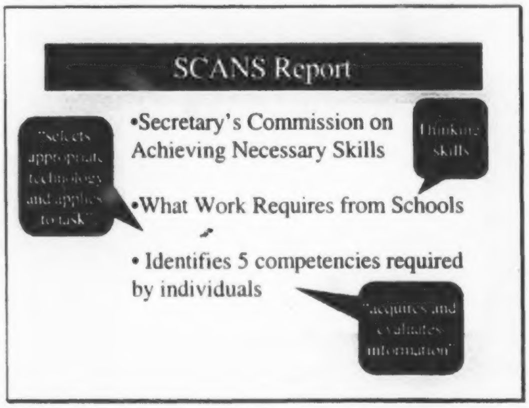
Slide 2



Information Literacy ...

...one who is able to recognize when information is needed and have the ability to locate, evaluate, and effectively use the needed information

Slide 3



SCANS Report

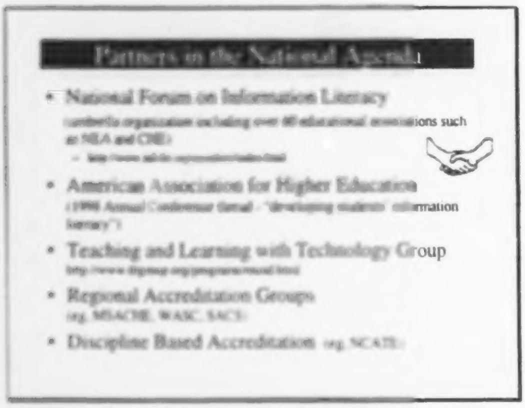
- Secretary's Commission on Achieving Necessary Skills
- What Work Requires from Schools
- Identifies 5 competencies required by individuals

"Selects appropriate technology and applies to task"

Thinking skills

"acquires and evaluates information"

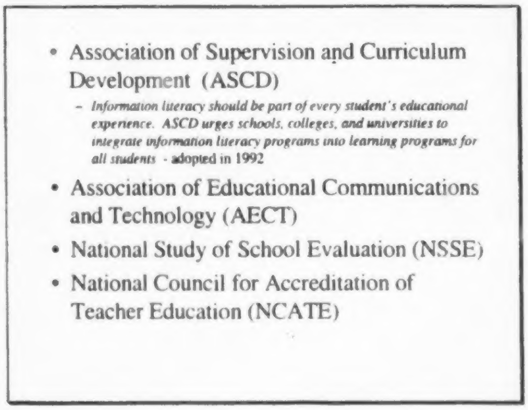
Slide 4



Partners in the National Agenda

- National Forum on Information Literacy
  (umbrella organization including over 60 educational associations such as NEA and CHE)
  - [illegible]
- American Association for Higher Education
  (1998 Annual Conference theme - "developing students' information literacy")
- Teaching and Learning with Technology Group
  [illegible]
- Regional Accreditation Groups
  (eg. MSACHE, WASC, SACS)
- Discipline Based Accreditation (eg. NCATE)

Slide 5



- Association of Supervision and Curriculum Development (ASCD)
  - *Information literacy should be part of every student's educational experience. ASCD urges schools, colleges, and universities to integrate information literacy programs into learning programs for all students* - adopted in 1992
- Association of Educational Communications and Technology (AECT)
- National Study of School Evaluation (NSSE)
- National Council for Accreditation of Teacher Education (NCATE)

Slide 6

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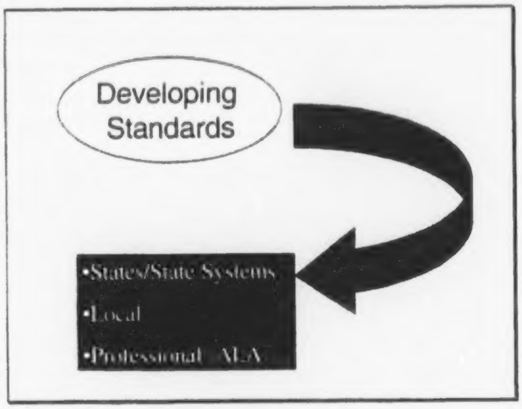
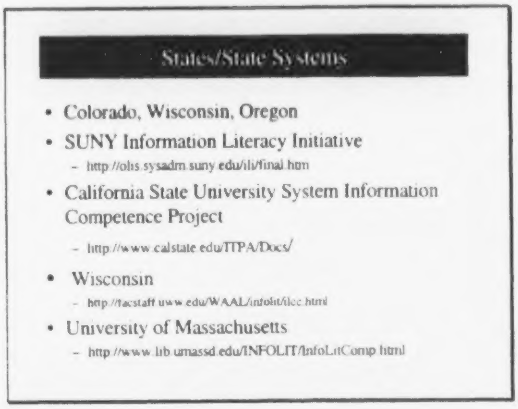


Developing Standards

- •States/State Systems
- •Local
- •Professional - ALA

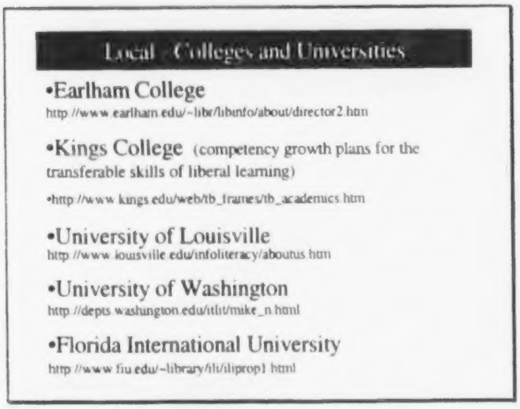
Slide 7



States/State Systems

- Colorado, Wisconsin, Oregon
- SUNY Information Literacy Initiative
  - http //olis sysadm suny edu/ili/final htm
- California State University System Information Competence Project
  - http //www calstate edu/ITPA/Docs/
- Wisconsin
  - http //facstaff uww edu/WAAL/infolit/ilcc html
- University of Massachusetts
  - http //www lib umassd edu/INFOLIT/InfoLitComp html

Slide 8



Local - Colleges and Universities

•Earlham College
http //www earlham edu/~libr/libinfo/about/director2 htm

•Kings College (competency growth plans for the transferable skills of liberal learning)

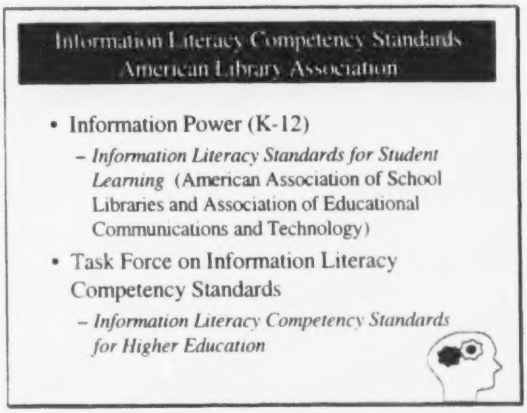
•http //www kings edu/web/tb_frames/tb_academics htm

•University of Louisville
http //www louisville edu/infoliteracy/aboutus htm

•University of Washington
http //depts washington edu/itlit/mike_n html

•Florida International University
http //www fiu edu/~library/ili/iliprop1 html

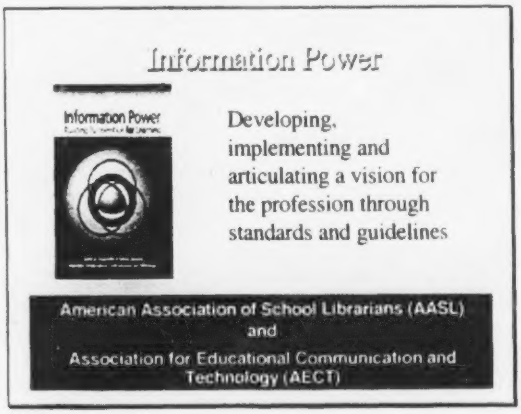
Slide 9



Information Literacy Competency Standards
American Library Association

- Information Power (K-12)
  - *Information Literacy Standards for Student Learning* (American Association of School Libraries and Association of Educational Communications and Technology)
- Task Force on Information Literacy Competency Standards
  - *Information Literacy Competency Standards for Higher Education*

Slide 10



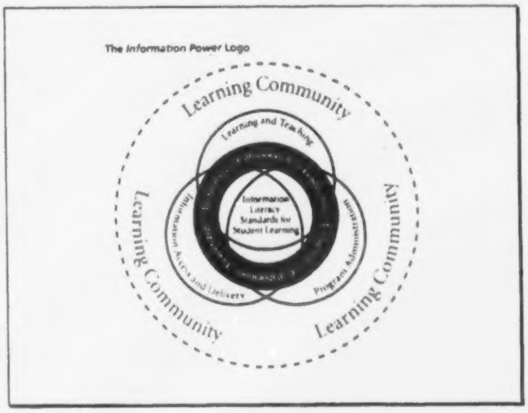
Information Power

Information Power

Developing, implementing and articulating a vision for the profession through standards and guidelines

American Association of School Librarians (AASL)
and
Association for Educational Communication and Technology (AECT)

Slide 11



The *Information Power* Logo

Learning Community
Learning and Teaching
Learning Community
Information Access and Delivery
Information Literacy Standards for Student Learning
Program Administration
Learning Community

Slide 12

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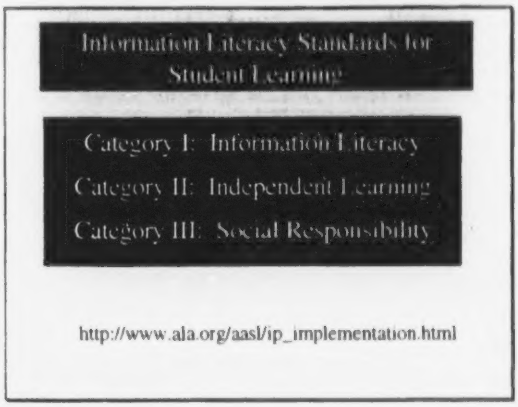


Information Literacy Standards for Student Learning

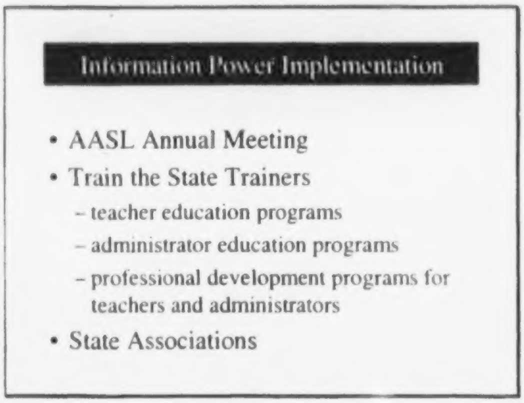
Category I: Information Literacy

Category II: Independent Learning

Category III: Social Responsibility

http://www.ala.org/aasl/ip_implementation.html

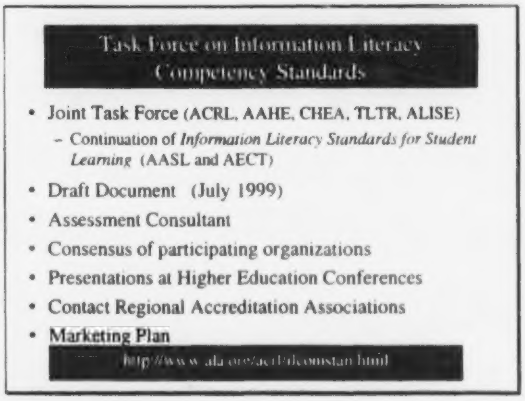
Slide 13



Information Power Implementation

- AASL Annual Meeting
- Train the State Trainers
  - teacher education programs
  - administrator education programs
  - professional development programs for teachers and administrators
- State Associations

Slide 14

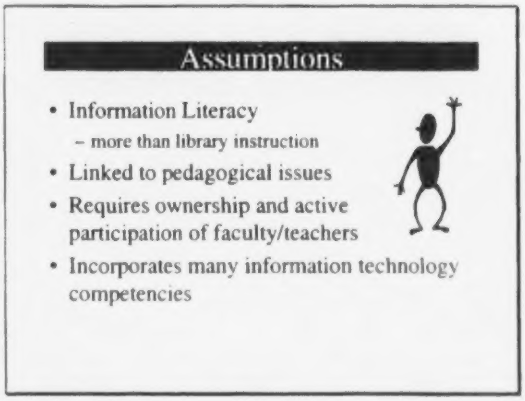


Task Force on Information Literacy Competency Standards

- Joint Task Force (ACRL, AAHE, CHEA, TLTR, ALISE)
  - Continuation of *Information Literacy Standards for Student Learning* (AASL and AECT)
- Draft Document (July 1999)
- Assessment Consultant
- Consensus of participating organizations
- Presentations at Higher Education Conferences
- Contact Regional Accreditation Associations
- Marketing Plan

http://www.ala.org/acrl/ilcomstan.html

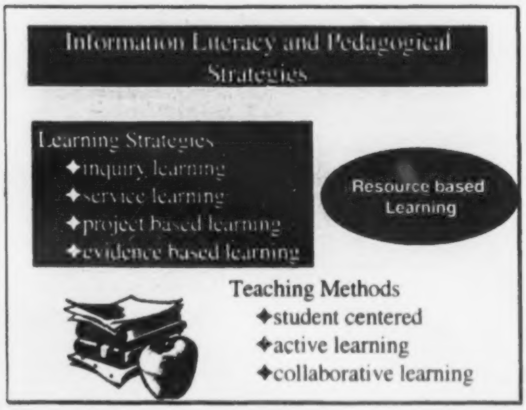
Slide 15



Assumptions

- Information Literacy
  - more than library instruction
- Linked to pedagogical issues
- Requires ownership and active participation of faculty/teachers
- Incorporates many information technology competencies

Slide 16



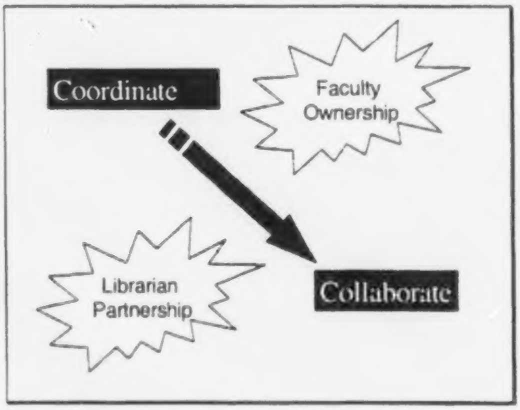
Information Literacy and Pedagogical Strategies

Learning Strategies
- ✦inquiry learning
- ✦service learning
- ✦project based learning
- ✦evidence based learning

Resource based Learning

Teaching Methods
- ✦student centered
- ✦active learning
- ✦collaborative learning

Slide 17



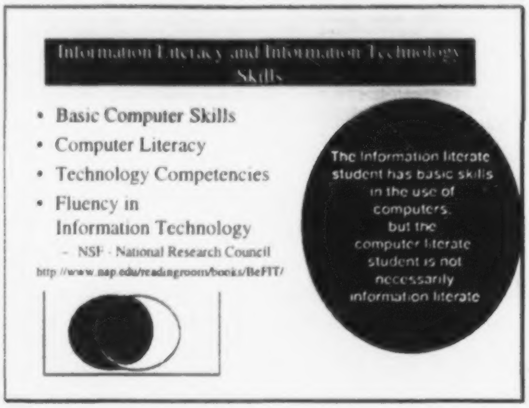
Coordinate

Faculty Ownership

Librarian Partnership

Collaborate

Slide 18



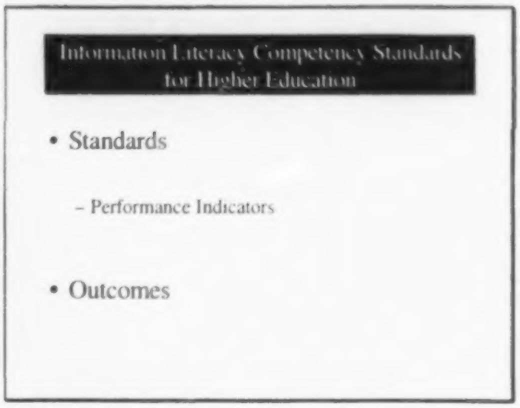
Information Literacy and Information Technology Skills

- **Basic Computer Skills**
- Computer Literacy
- Technology Competencies
- Fluency in Information Technology
  - NSF - National Research Council

http://www.nap.edu/readingroom/books/BeFIT/

The information literate student has basic skills in the use of computers, but the computer literate student is not necessarily information literate

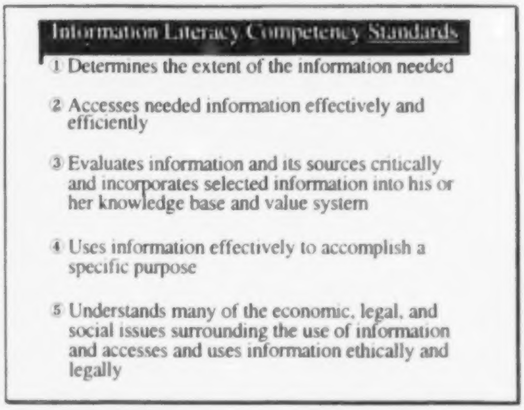
Slide 19



Information Literacy Competency Standards for Higher Education

- Standards
  - Performance Indicators
- Outcomes

Slide 20



Information Literacy Competency Standards

① Determines the extent of the information needed

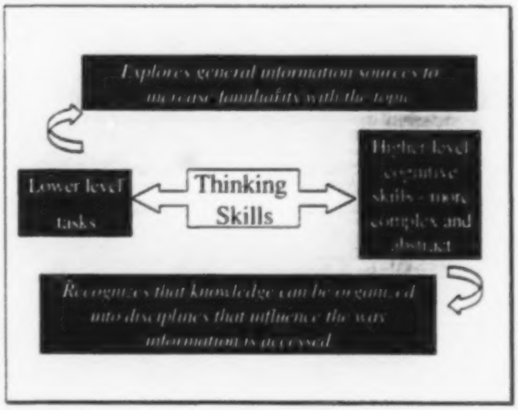
② Accesses needed information effectively and efficiently

③ Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system

④ Uses information effectively to accomplish a specific purpose

⑤ Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally

Slide 21



Explores general information sources to increase familiarity with the topic

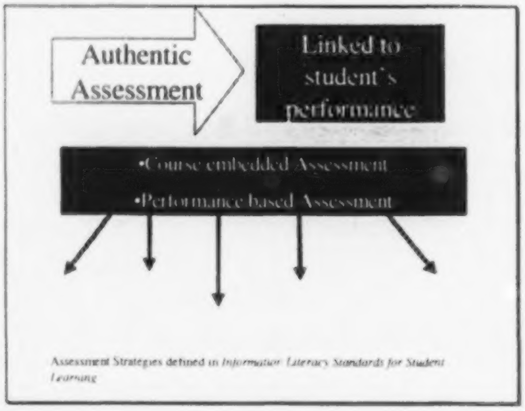
Lower level tasks

Thinking Skills

Higher level cognitive skills – more complex and abstract

Recognizes that knowledge can be organized into disciplines that influence the way information is accessed

Slide 22



Authentic Assessment

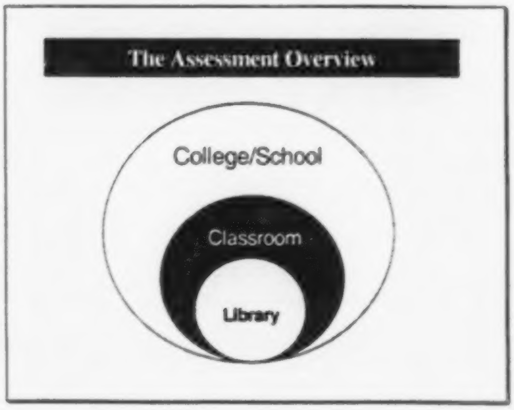
Linked to student's performance

•Course embedded Assessment

•Performance based Assessment

Assessment Strategies defined in *Information Literacy Standards for Student Learning*

Slide 23



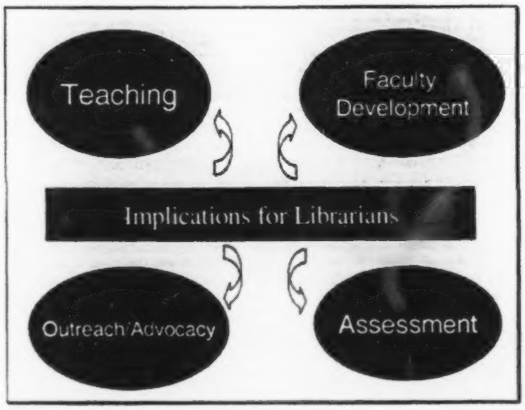
The Assessment Overview

College/School

Classroom

Library

Slide 24



Teaching

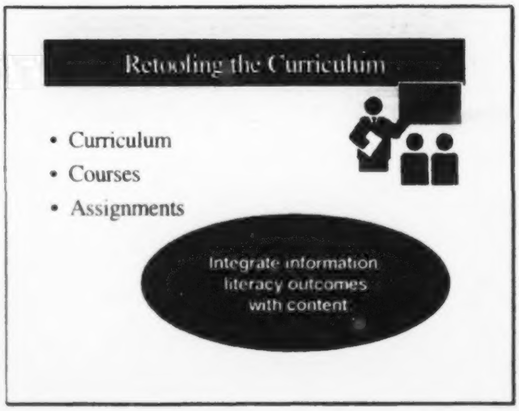
Faculty Development

Implications for Librarians

Outreach/Advocacy

Assessment

Slide 25

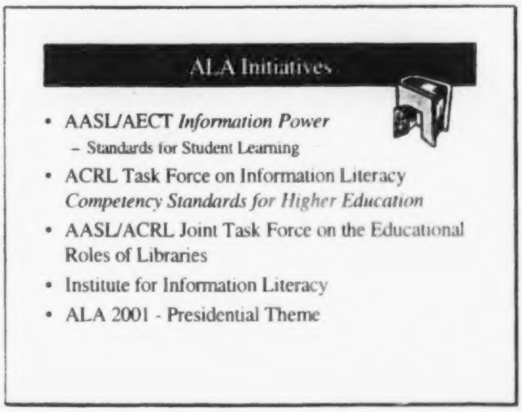


Retooling the Curriculum

- Curriculum
- Courses
- Assignments

Integrate information literacy outcomes with content

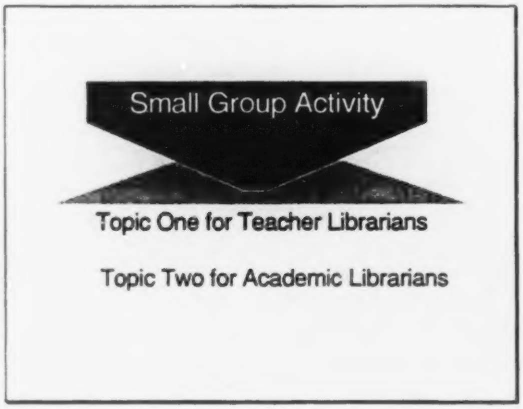
Slide 26



ALA Initiatives

- AASL/AECT *Information Power*
  - Standards for Student Learning
- ACRL Task Force on Information Literacy *Competency Standards for Higher Education*
- AASL/ACRL Joint Task Force on the Educational Roles of Libraries
- Institute for Information Literacy
- ALA 2001 - Presidential Theme

Slide 27



Small Group Activity

Topic One for Teacher Librarians

Topic Two for Academic Librarians

Slide 28

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PANEL SESSION: WHAT *IS* THE CHALLENGE?

Panel: *Ross Todd, Ken Haycock, Carmel O'Sullivan, Linda Langford*
Chair: *Alan Bundy*

The panel addressed the question: Information literacy: what *is* the challenge?

Carmel O'Sullivan believed the challenge would be to target a new audience such as the corporate world. Knowing, understanding and empathising with your audience enables you to educate them about life long learning. Using appropriate language, avoiding buzzwords and jargon and adjusting your way of thinking to theirs are also important strategies. This is a particular challenge for special librarians working in a corporate environment where education as such is not seen as a key role for them. Lifelong learning is a concept that is understood in the corporate sector, but not 'information literacy'.

Challenges for academic libraries include forming research partnerships with corporate bodies. This requires an integration of language needs and acquiring the ability to 'connect' and tap into the values of the corporate world, eg profit, productivity, environment. The corporate sector believes that something for nothing is valueless. We need to charge clients (actual costs, time + resources + staff) for research and groups for resources. True value and true benefits need to be identified.

The challenge in working with students includes instilling a desire for lifelong learning. Employers want employees to have these skills. We need to market these skills to students, as a graduate marketable skill desired by the corporate community, making the connection with the 'world after study'.

Strategies for academic libraries may also include

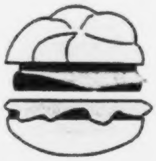
- finding a lecturer who is least likely to use the library and 'educate' them about information literacy and the benefits to them and their students. If they become convinced, they will be excellent advocates for information literacy
- finding a graduate or student who can be an information literacy 'champion'
- tying information literacy into assessment processes where students will see it as an important element.

Linda Langford believed that the key challenge with information literacy is not to be static but always moving and evolving.

Key challenges for academic libraries include integrating information literacy into the curriculum and teaching the skills so that our users' lives will be enriched. She stated that 'curiosity is always there – a two year old child will continually ask what, where, when, why and how – academic libraries need to capitalise on this process'.

To illustrate this point we can use two mental models

The knowledge sandwich



The crust gets stronger and richer as our information literacy skills increase.
The butter is the developmental process – skills, values, knowledge.
The fillings are discipline skills – Science – English skills – etc.

Life is complete, beautiful

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The foot is the grounding for information literacy and what moves us forward
The shell represents our values, knowledge and discipline related skills which is continually built upon.
The antennae represent sensitivity, the ability to relate to others and to react positively to things, to succeed in life within our own parameters and function well in society.

The challenge is to define a mental model for information literacy that our users can relate to.

Ross Todd
The main challenge is how to make information literacy a profound social force across a person's life span.

•0yrs *•20yrs* *•30yrs* *80yrs+*
Information literacy focus in formal education and....informal education and.....................lifelong learning

Over 25s, retirees, employees need to keep up to date with current issues, have leisure time to learn or require new skills/training for work. Information literacy is for everyone and there is a role for public libraries in assisting people to access relevant information to understand/clarify life events eg the referendum and simple everyday needs such as bus timetables/routes, how do you quilt, how is this baby going ...; to empower people.

Key challenge is to make information literacy a profound social force. Lifelong literacy is important as we are all lifelong learners and it needs to be a component of life's agenda.

Key questions are
- Are critical thinking/critical literacy skills enough to sustain people for lifelong learning?
- Do we need to move beyond our current information literacy framework?

Key challenges are
- for us to know more about critical thinking processes
- to add information literacy to research agendas
- to identify the client to find out how/why people require/absorb knowledge
- to make the links between information literacy, lifelong learning, knowledge, the information economy
- to lobby government on these links and repackage information literacy so that it can be more easily understood by politicians

Ken Haycock
There are a number of different information literacy skills – visual, written, computer searches, comprehension. Information literacy has been presented as text based, library skills based, but a major source of decision making is other people. People therefore need to be competent in getting information from other people. Personal discussion is an information skill. The challenge for us is to look beyond the traditional information literacy focus and identify the extra skills *we* need to take information literacy forward in the 'big picture' of people's lives.

Construction workers, shop workers, taxi drivers do not want to attend courses in information literacy skills. They just want the information not the skills to locate the information – what do we know about their requirements and how will we meet them?

The challenge is to improve partnerships between the education sectors. Information literacy is focused in formal education. How do we enhance the information literacy skills between all levels of education; preschool, junior primary, primary, secondary, higher education? Outreach programs, curriculum resources, Internet resources, professional associations are strategies we can and do use. The challenge is to demonstrate that knowledge empowers – throughout life.

Other strategies include

- using public library services more
- taking information literacy outside the educational institution and going out to industry
- using professional associations to lobby more for information literacy
- developing liaisons between schools and universities
- encouraging more research
- need to communicate what we are doing
- marketing the role of the teacher librarian
- providing a seamless service between all libraries

Major misconception within the library profession is that 'if we (one sector) are doing it, everyone is doing it'. Challenge is to put the issue of information literacy into library schools' and into the agenda of our professional associations.

214

ABOUT THE CONTRIBUTORS

Denis Ralph
Opening Speaker

Professor Denis Ralph is the Director of the South Australian Centre for Lifelong Learning and Development. A graduate of the University of Adelaide, he holds a Master of Educational Administration degree from the University of Alberta and is a Fellow of the Australian College of Education. Previously he was Chief Executive of the Department of Education, Training and Employment in South Australia and prior to that Deputy Director General of Education in New South Wales. During his thirty seven years in education in South Australia he was a classroom teacher, a principal, a district superintendent and a regional director. He has managed the effective introduction of significant educational and public sector management reforms in South Australia and New South Wales and has made significant headway with Aboriginal reconciliation as Chair of the South Australian Advisory Committee on Reconciliation. Denis is a Business Ambassador for South Australia and a Trustee for the South Australian Employers Chamber of Commerce and Industry. He took up the position as Director of the Centre for Lifelong Learning and Development in February 1999 and has successfully established this Centre at Flinders University.

Ken Haycock
Keynote Speaker

Ken Haycock is Professor and Director of the School of Library, Archival and Information Studies at the University of British Columbia in Vancouver; until 1992 he was Director of Program Services with the Vancouver, British Columbia, School Board where his responsibilities included K-12 program development and implementation, the management of curriculum resources and technologies, and district and school based professional and staff development and training for more than 7000 staff in 110 schools. Professor Haycock worked as a teacher and teacher librarian, as an educational media consultant and as a coordinator of library services for a large urban school board; he has taught graduate courses at several universities and has led hundreds of staff development programs for schools, school systems, universities, associations and government departments in five countries. He was also an elementary school principal of a school of 500 students.

Ken Haycock has been honoured by Phi Delta Kappa as one of the leading young educators in North America and received the Queen Elizabeth II Silver Jubilee Medal for contributions to society. For his work he has received distinguished service awards from several professional associations, including the Canadian Library Association and the American Association of School Librarians. Ken is also known for pioneering the concept of cooperative program planning and teaching whereby teachers and librarians collaborate to integrate information problem solving skills and strategies in the curriculum and team teach and assess student progress. His recent books include *Foundations for effective school library media programs* (Libraries Unlimited, 1999), *School librarianship: international perspectives and issues* (International Association of School Librarianship, 1998), *What works: research about teaching and learning through the school's library resource center* (Rockland Press, 1992) and *Program advocacy* (Libraries Unlimited, 1990).

In 1993, Professor Haycock was named a Fellow of the Canadian College of Teachers. He was also elected to the school board of the West Vancouver (British Columbia) School District; in 1994 he was elected president of the Board. In 1995 he was the only Canadian elected to the Council of the American Library Association, was elected president of the Council for Canadian Learning Resources and was named Executive Director of the International Association of School Librarianship. In 1997 he was elected president of the American Association of School Librarians. In 1999 he was elected to the executive board of the American Library Association. Ken is also the editor of *Teacher librarian: the journal for school library professionals*.

An American journal once described Ken Haycock as a Canadian having the energy of ten Mounties; he is involved, committed and contributes to the professions and issues he believes in, namely teaching and learning to enable all citizens to become informed decision makers in a national context, and with a commitment of lifelong learning

Ross Todd
Keynote Speaker

Ross Todd is Head of the Department of Information Studies, and a senior lecturer in the Faculty of Humanities and Social Sciences at University of Technology Sydney. He teaches primarily in the information user behaviour area. Previous to his university appointment he was a secondary teacher and teacher librarian in Australian and New Zealand schools. His research areas include information literacy, critical literacies and the net, the nature of information, knowledge structures and cognitive information utilisation. His PhD focused on how adolescent girls utilise information about heroin. In particular, he has been researching aspects of information literacy since 1991, and has published widely in that area.

In 1993 he was presented with an Award for Excellence in Teaching by the University, and in 1995 was made an Apple Teaching Fellow by Apple Computer Australia Pty. Ltd. In 1999 he was awarded the John Hirst Award by the ASLA (NSW) for services to school-libraries. He is vice president (Special Interest Groups) of IASL; and is deputy chair of the Board of Education for the Australian Library and Information Association. He is also editor of *Research columns* in the Australian journal *SCAN* which features research about information literacy.

Patricia Iannuzzi
Workshop Facilitator

Patricia Iannuzzi is Head of the Reference Department and Codirector of the Information Literacy Initiative at Florida International University Library. She publishes, speaks, and presents workshops on various topics related to information literacy and faculty development; information literacy and assessment; and information literacy and organisational culture. Patricia is currently cochair of the Association of College and Research Libraries/American Association of School Libraries (ACRL/AASL) Joint Task Force on the Educational Role of Libraries, which is developing a *Blueprint for collaboration* between academic and school libraries. She is also chair of a Task Force on Information Literacy Competency Standards for Higher Education, with representatives from various higher education associations.

Joanne Anderson

Joanne Anderson holds a Bachelor of Library and Information Management and a Graduate Certificate of Vocational Education and Training (Curriculum and Instruction). She has also completed International Adult Learning in Domestic and Transcultural Settings, a course within the Master of Education, University of San Francisco. Currently Joanne is Remote Area Librarian at the Batchelor Institute of Tertiary Education. For the past three years she has been responsible for information literacy programs at the Batchelor Campus and provision of library services to remote clients. The information literacy program is tailored to the Aboriginal and Torres Strait Islander students of the Institute. Prior to this position, she worked as the Community Libraries Liaison Officer with the Northern Territory Library and was responsible for training and support to Community Library Officers in 22 remote libraries across the NT, 18 of which were in Aboriginal communities.

Julie Badger

Julie Badger holds Bachelor of Arts, Diploma in Education, Graduate Diploma in Librarianship and a Graduate Certificate in Management and she is currently studying towards a Master of Marketing. Since 1997 she has held the position of Liaison Librarian (Business and Applied Science) at Swinburne University of Technology, Lilydale Campus. Julie also tutors in Marketing to first and second year Bachelor of Business students at this campus. Previous positions include Business Liaison Librarian at Victoria University of Technology, St Albans Campus, reference librarian positions at a number of academic institutions including VUT, Western Melbourne TAFE, Holmesglen TAFE and at the Australian Council of Educational Research, where she compiled and edited the *Australian education index*, *Bibliography of educational theses in Australia* and the *Australian education directory*. Julie has also taught at secondary level.

Julia Bale

Julia Bale is the Technology Librarian at Pymble Ladies College, a large, independent girls secondary school in Sydney. She has qualifications in education and librarianship and has a background in teaching, database design and management (as a result of 11 years in industry) and information consultancy. She combines a full time school library career with tertiary study, conducts training courses in information technology and is a frequent contributor to the *Online currents* magazine.

Susan Boyce

Susan Boyce is Head of Library at the Caulfield Campus of Caulfield Grammar School, Melbourne. Her interest in information literacy is from a social and cultural perspective. This interest has continued from her Master's of Education degree, which focused on the impact of information communications technologies on the literacy practices of a school community, to her current doctoral research and studies on literacies and school libraries.

Chris Brewer

Chris Brewer has held the position of Faculty Librarian, Health and Behavioural Sciences at the University of Wollongong Library since 1993. Prior to that she had a long history with the public library service. She has also been involved in teaching in the Associate Diploma, Library Practice. Chris has been active in promoting an integrated learning environment within the faculty, and works closely with staff to ensure that they and their students develop the skills to ensure that they become lifelong learners. She is currently working toward a Master degree in Adult Education and Training, with a second specialisation in Information Technology in Education and Training. She has had an article published in *Overview* (a publication of the Centre for Educational Development and Interactive Resources (CEDIR) in association with the Teaching and Learning in Higher Education Research Group, University of Wollongong), with a second submitted for consideration. She has jointly written a paper with three members of the Department of Nursing and the Reference Librarian which was published in *Nurse education today*.

Christine Bruce

Christine Bruce is Senior Lecturer in the School of Information Systems and Associate Director of the Information Systems Management Research Centre. She teaches information organisation, professional practice, information user instruction and research methods. Christine has been involved in information literacy research and practice since 1989. She regularly conducts workshops for library staff and other educators, and has consulted to a number of universities on the implementation of information literacy programmes. Her recent monograph *Seven faces of information literacy*, published by Auslib Press, won the American Library Association ACRL Instruction Section's Publication of the Year Award for 1999.

Jenny Cameron

Jenny Cameron has worked at Victoria University, St Albans Campus since 1989. Since 1991 she has been in a job share position as the Arts Subject Liaison Librarian, jointly responsible for user education, collection management and research support for the staff and students of the Faculty of Arts and TAFE Social Sciences and Humanities Departments at the St Albans Campus. Her earliest years in libraries were at Swinburne University of Technology, Hawthorn Campus in a variety of part time and full time positions, including several years as a cataloguer.

Natalie Cuffe

Natalie Cuffe is Reference Librarian (Collections) at the Law Library at Queensland University of Technology. She has a law degree, library qualifications and is currently completing a Master of Information Technology (Research). Her current responsibilities at the University include legal research classes for both law and non law students, at undergraduate and post graduate level, as well as training for outside organisations. Her previous experience in a law firm, the Supreme Court Library of Queensland and as an Associate Lecturer inspired her interest in information literacy, legal research, legal education and the ever increasing role of librarians as educators.

Jillian Dellit

Jillian Dellit is currently responsible for Strategy, Policy and Marketing for Education.Au Limited, the company which manages Education Network Australia (EdNA). She is on leave from the South Australian Department of Education, Training and Employment, where she managed The Orphanage Teachers Centre for the last seven years, and the DECS*tech* 2001 project providing technology infrastructure to schools for the last two. She has been a school principal, library adviser, affirmative action coordinator as well as an English/History teacher and teacher librarian. Her initial training and teaching was in NSW. She has lived in South Australia for 25 years.

Anne Douglas

Anne Douglas is a subject liaison librarian at RMIT University with 14 years experience, primarily in the fields of applied science and engineering. She has extensive experience in the provision of information research skills to staff and students, from undergraduate through to higher degree level. Her other major area of interest is the provision of a high standard reference service and the associated staff training issues.

Anne Draper

Anne Draper has been a librarian at the Dorothy Hill Physical Sciences and Engineering Library, University of Queensland since 1990. Anne has been involved in designing and teaching information literacy programs for engineering students at all levels including postgraduate students for a number of years. Anne began her library career as a special librarian with Telstra.

Carole Duffill

Carole Duffill holds the position of Humanities and Social Sciences Librarian at the University of Western Australia which after a brief sortie into Technical Services very early in her career confirmed for Carole Duffill that the client services section was really where she belonged if she were to remain in librarianship. Working in a tertiary library as a reference librarian dealing with students and staff at all levels over a range of disciplines, and as a manager of a subject library in the social sciences and humanities, has given her a long standing interest in the role of information literacy in academic libraries. Her aim has always been to develop effective programs which academic staff want to integrate into their courses. Carole has experienced many changes in emphasis, content, goals and delivery methods in information literacy programs which have reflected developments in technology, the curriculum and educational priorities.

Robin Graham

Robin Graham has been involved in teaching and learning in the tertiary sector for many years. Currently she leads the Learning Services team and is also the coordinator of Information Literacy at Christchurch Polytechnic. Robin works in an integrated learning centre which comprises the Library, Learning Services, Staff Development and Flexible Delivery where she is responsible for initiating the integration of information literacy into program areas.

Garry Hall

Garry Hall is the Director of the Bathurst Campus Library, Charles Sturt University. He has extensive experience in training staff and students in library and information skills, particularly with computer based and web based materials. Garry has worked on a number of externally funded projects including an NBEET funded project to deliver remote training to postgraduate students (Central Queensland University), an Open Learning Australia (OLA) tender that produced CBT packages and videos for OLLIS (University of Southern Queensland) and, currently, a joint project between Charles Sturt University and UNILINC to develop a customisable, interactive web based information literacy shell, *Web-ezy*.

Liz Hartmann

Liz Hartmann is a member of the Information Literacy and Research Services team at the University of Ballarat Library. Among her responsibilities are to design and deliver the information literacy programs to first year undergraduate students and students at risk. Liz has previously been employed as a reference librarian at the University and in the public library sector as a children's services librarian and reference librarian. Liz is currently enrolled in the Graduate Certificate of Education (Tertiary Studies) course at the University and is shaping up a research project to reflect some of the questions raised in Natalie Radomski's review of information literacy at the University. Liz is also an active member of the local Branch of ALIA.

Claire Hill

Claire Hill is currently the Project Coordinator for AVEL (Australian Virtual Engineering Library). AVEL is a gateway for quality Australasian engineering and information technology resources. For the past two years she has been working at the Dorothy Hill Physical Sciences and Engineering Library, University of Queensland. Claire has been involved in many projects to support research and teaching for the engineering departments at the University. During 1999 she created a web based instructional course, using WebCT, for all first year engineering students. The evaluation of these classes within an action research framework was a focus of her study towards a Master of Information Technology which she recently completed.

Leone Hinton

Leone Hinton holds a Master of Education Administration degree and is currently Associate Dean (Teaching and Learning) within the Faculty of Arts, Health and Sciences at Central Queensland University. In the undergraduate program Leone teaches undergraduate units as well in several Masters degrees in the area of the sociology of health, moral philosophy and bioethics. From 1993 until 1996 she was the management consultant for several aged care institutions. Leone is currently studying for her Doctorate in Education in the area of the first year experience at university. Leone's research interests directly involve her doctoral work and she has copublished papers on first year students, collegiality, creating conducive educational environments for students and exploring the issue of information literacy as an aspect of lifelong learning. Her preferred research methodologies are action research and phenomenonology.

Diana Kingston

Diana Kingston is currently Dentistry Librarian at the University of Sydney. Her previous positions include Information Services Librarian at the Medical Library and Circulation Librarian. She is interested in the development of information skills by students and others within a framework of self paced, self directed learning principles. These principles underpin the design of the new Sydney University medical degree and the proposed Sydney dentistry degree. Diana holds a PhD in library and information management from the University of New South Wales.

Linda Langford

Linda Langford is a PhD student in the School of Information Studies at Charles Sturt University. A teacher librarian, Linda has a passionate interest in how the workplace learns and how learning communities develop. Linda is an active member of her local, state and national association of ASLA. Her commitment to lifelong learning is evident in the workshop, seminars, and papers she contributes at both the national and international level. Currently Linda is the editor of *Access*, ASLA's professional journal. She is a contract lecturer in Teacher Librarianship at Charles Sturt University (CSU) and is a member of the core development team for the Information Literacy Project at CSU. Her teaching and research interests include accountability in professional development, sharing human knowing, change theory and learning communities, as well as issues centering on gifted and talented education.

Justine Lester

Justine Lester has been Information Skills Librarian at Christchurch Polytechnic since 1995. Justine work in an integrated learning centre which comprises the Library, Learning Services, Staff Development and Flexible Delivery where her job involves the development and delivery of onsite and off campus information literacy courses for staff and students. She has recently completed a project that involved the transfer of a distance information skills course from paper base to online.

Kerry Matheson

Kerry Matheson is Information Librarian in the Information Literacy and Research Services Team at the University of Ballarat Library. Previous positions have included Serials Librarian, Cataloguing Librarian and working within the interlibrary loans team. She has a strong professional interest in offcampus services to post graduate students and the promotion of information literacy and lifelong learning for all students. Kerry has responsibilities for staff and post graduate training at the University. She is currently studying to complete the Graduate Diploma of Education (Tertiary), and is actively involved with ALIA at the branch level where she is secretary.

Lynn Murdoch

After moving from private industry, Lynn Murdoch has worked as a subject liaison librarian in academic libraries in a range of subject disciplines. She has provided information research skills classes to undergraduate and postgraduate level students and staff. While working overseas, she was involved in developing student profiles for graduates from Education courses, which were used by students to monitor their progress through their course. She is currently also Staff Development Coordinator for the RMIT University Library.

Maureen Nimon

Associate Professor Maureen Nimon is currently the Research Coordinator for the School of Communication and Information Studies at the University of South Australia. She has responsibility for supporting 40 research students and their supervisors and in this role, she is particularly interested in cooperative efforts between academics, administrators and librarians in assisting research activities. Her former position as an Associate Dean, Teaching and Learning, also influences her interest in information literacy.

Graeme Oke

Graeme Oke has worked as Science Subject Liaison Librarian at the Victoria University of Technology since the Werribee campus was opened in 1992. Previously he worked in a bank, in science research, as a laboratory assistant, as a librarian in a special library, and as a cataloguer for a book supply company. As Science Subject Liaison Librarian at the University he liaises with academics and research staff in the School of Life Sciences and Technology as well as three centres for research and the TAFE Science Departments.

Graeme runs user education classes for undergraduate, postgraduate, TAFE students, and the staff of these areas and also for the Arts faculty at his campus.

Debbie Orr

Debbie Orr is the Senior Librarian: Reference Services and Information Literacy at Central Queensland University. She is enthusiastic about the role of the library in the learning and teaching environment, and is actively involved in (and coordinates) a number of information literacy projects at the University.

Carmel O'Sullivan

Carmel O'Sullivan is Legal Information Manager for Blake Dawson Waldron, Brisbane. Her role includes coordinating legal research training nationally for the firm's libraries. Previously, she was Legal Research Skills Coordinator at the University of Queensland Law Library. She is interested in applying information literacy theory to the real life environment of a law firm, and in how knowledge management and information literacy relate in an organisational context. Carmel has degrees in Arts and Law and post graduate qualifications in librarianship.

Judith Peacock

Judith Peacock is Information Literacy Coordinator at Queensland University of Technology (QUT) and is responsible for the development, implementation and management of the Library's information literacy program. Her role includes provision of advice and recommendations on policies and procedures for the provision of, and client access to, Information Literacy programs and services across QUT Library and the University. She works collaboratively with faculties and academic and Library teaching staff to provide assistance with, and advice on, effective strategies for the integration, delivery and evaluation of information literacy competencies within the University's curricula. Previous to this position, Judith has worked as a primary school teacher and, for the last six years, as a reference liaison librarian at QUT Library.

Sharon Rushton

Sharon Rushton is currently Head of Library Services at the Trinity Lutheran College, Ashmore, Queensland. She has taught secondary and primary levels since 1967 and has been a teacher librarian since 1990. She holds a Master of Science, University of Nevada and a Graduate Diploma Teacher Librarianship, Queensland University of Technology. She has authored a number of children's books published by Macmillan.

Margie Wallin

Margie Wallin is the Health Sciences Liaison Librarian at Central Queensland University. A key component of the liaison role revolves around teaching for both students and staff, and Margie has a keen interest in information literacy and the practical integration of information literacy into the curriculum. Another area of interest and concern is based upon how libraries can support the information literacy needs of those studying via flexible delivery methods.

Leith Woodall

Leith Woodall has been a librarian at the Dorothy Hill Physical Sciences and Engineering Library, University of Queensland, since 1990. Leith has been involved in developing and teaching information literacy programs for engineering and earth sciences undergraduate and postgraduate students for a number of years. She was involved in the review of the first year information literacy program. She has developed a web based course for this first year program. Leith began her library career at the Radcliffe Science Library, Oxford, and worked at Griffith University Library before moving to her current position.

221

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CONFERENCE PROGRAM

Friday December 3 1999

7.45 - 8.45	Registration
8.50 – 9.00	Welcome *Alan Bundy* University Librarian and Director, Bob Hawke Prime Ministerial Library, University of South Australia. Convener ALIA Information Literacy Special Interest Group
9.00 - 9.30	Information literacy and foundations for lifelong learning *Denis Ralph* Professor and Director Centre for Lifelong Learning and Development
9.30 - 10.25	Grounding information literacy in a stronger theoretical framework *Ross Todd* Head, Department of Information Studies, senior lecturer Faculty of Humanities and Social Sciences, University of Technology Sydney
10.30 - 11.00	Morning tea
11.00 - 1.00	**Parallel Session A** Chair *Wynton Heading* Campus Librarian, University of South of Australia Information and information technology use in undergraduate legal education *Natalie Cuffe and Christine Bruce* Profiling an information literate law firm *Carmel O'Sullivan* **Parallel Session B** Chair *Jan Heath* Campus Librarian, University of South Australia Integrating information literacy into the health sciences curriculum *Chris Brewer* Information literacy and health science: developing a comprehensive and sustainable model *Margie Wallin, Debbie Orr and Leone Hinton* **Parallel Session C** Chair *Andrea Rankin* Reference Librarian, Flexible Delivery Services, University of South Australia Integration of information skills into the school curriculum at Trinity Lutheran College *Sharon Rushton* The Library's role in the information and computer literacy program at Swinburne *Julie Badger*
1.00 - 2.00	Lunch – ALIA Information Literacy SIG AGM
2.00 - 4.00	**Parallel Session D** Chair *Eleanor Whelan* Campus Librarian, University of South Australia Online postgraduate information research skills *Anne Douglas and Lynn Murdoch* Too easy – Web-ezy : an interactive library skills package *Garry Hall*

Parallel Session E
Chair *Anthea Duthie* User Services Librarian, Douglas Mawson Institute of TAFE Port Adelaide Campus

Cooperation and information skills resources
Diana Kingston
The dream student …..a case study of an information literacy model for higher education
Robin Graham and Justine Lester

Parallel Session F
Chair *Anne Hazell* Project Officer, DECS*tech* 2001 Project

Internet sources for lifelong learning: a model for incorporating a web component into a course
Carole Duffill
Why won't they use our library? Implications of a pilot study investigating the information seeking preferences of secondary school teachers
Julia Bale

4.00 - 5.00 **Reflections on the day: questions to speakers**
Chair *Alan Bundy*

7.00 - 10.00 Conference dinner
Speaker *Professor Ken Haycock*

Saturday 4 December 1999

8.35 – 9.45 Keynote address sponsored by Infosentials Ltd
What all librarians can learn from teacher librarians: Information Literacy a key connector for libraries
Professor Ken Haycock Professor and Director of the School of Library, Archival and Information Studies, University of British Columbia

9.45 - 10.15 Morning tea

10.15 -12.15 **Parallel G**
Chair *Sherron Hunter* Liaison Librarian, University of South Australia

Changing the mind set – creating Information Literate engineers
Anne Draper and Leith. Woodall

Parallel H
Chair *Stephen Parnell* Associate Librarian: Client Services University of South Australia

Striking the right balance: information literacy and partnerships in learning between librarian, lecturer and student
Maureen Nimon
Getting information literacy into the curriculum: the ongoing dilemma and how to be involved when you are on the edge
Graeme Oke and Jenny Cameron

Parallel I
Chair *Larry Amey* Professor, School of Communication and Information Studies, University of South Australia

Information literacy and indigenous adults
Joanne Anderson

12.15 - 1.00 Lunch

1.00- 3.00 **Parallel J**
Chair *Di Booker* Manager International, Adelaide Institute of TAFE

Impact of information literacy demand of schooling delivery
Jillian Dellit
From trainers to educators: librarians and the challenge of change
Judith Peacock

Parallel K
Chair *Caroline Wood* Lecturer, Learning Services, Learning Resource Centre, Adelaide Institute of TAFE

Improving information skills programs using action research
Claire Hill
Subject specialist or information expert
Liz Hartmann and Kerry Matheson

Parallel L
Chair *Anne Hazell* Project Officer, DECS*tech* 2001 Project

Literacy, information literacy and the school library
Susan Boyce
Information literacy, the commercial perspective
Richard Siegersma

3.00 - 4.00 What is the challenge?
Chair *Alan Bundy*
Panel *Ross Todd, Ken Haycock, Carmel O'Sullivan and Linda Langford*

4.00 - 4.30 Conclusion *Alan Bundy*

Sunday 5 December 1999

9.30 – 1.00 Information Literacy Competency Standards Workshop
Facilitator *Patricia Iannuzzi*